psa JOURNAL

VOLUME 17 NUMBER 11

NOVEMBER 1951

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PSA HONORS . . .

EACH YEAR, come Annual Meeting, PSA confers Associateships, Fellowships, Honorary Memberships, and Honorary Fellowships upon those who have demonstrated their abilities and services, or whose work is so outstanding as to be widely recognized. Each year also some members protest the award of Honors to some, or the failure to honor others. These are natural, human protests, not infrequently based upon misunderstanding.

HONORS RECIPIENTS are selected by a committee on the basis of information provided by applicants or their friends. These data are filed in the spring, and are considered and re-considered many times before final selection of the recipients. The task is not easy. The clerical work alone is tremendous. And while the PSA Honors Committee strives to be fair, just, and considerate, it is only human and, therefore, prone to err.

HUMAN AND prone to err also are members who, in voicing suspicions as to the probity and ancestry of members of the Honors Committee, forget that failure to achieve Honors is neither intentional injustice, disgrace, or irremediable. Reasons for failure are many, ranging from delay in filing applications to heavy competition from candidates of great achievement. The situation calls for trying again. Or for developing capabilities to the point which overwhelms any possible competition. Or for making a record which establishes merit as obvious.

THERE IS no mathematical formula to facilitate human rating for PSA Honors. There are many human factors to be considered. PSA and its Honors Committee desire to recognize all who are deserving. And failure so to do represents no antipathy to any applicant, but a temporary adverse combination of circumstances beyond human control. . . . V. H. SCALES

PSA CONVENTION

New York, New York, August 13–16, 1952

THE PRESIDENT REPORTS . . .

Acting as a special committee to work on several areas of PSA interests has, in the past seven months, given me a clearer view of the splendid job that has been done in and for the Society in the past years. As an incoming officer facing new and frightening duties, I am especially grateful to those who have built so well the foundation we now enjoy.

PSA is a strong force in photography, respected for its integrity both here and abroad, and considered by outsiders (even more than among ourselves) to be the one greatest potential force for the promotion of photography. Of the truth of that feeling, I am entirely convinced. Through the years, the officers and members of PSA have built carefully on a foundation which they remodeled and improved as

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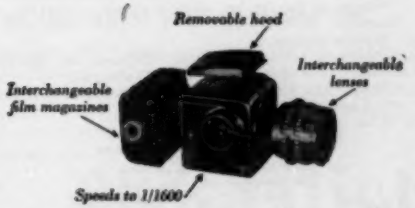

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It now is evident that the immediate task is to remove the word "potential" from the above definition of PSA's power to serve photography and photographers. We have the strength and the ability and the know-how: now we must put those assets to work.

It is no small job which faces PSA. Our Society has a wonderful line-up leading the work of the various Divisions and Committees but those leaders need help. We are tempted to ask too much of too few, so each of us has both the opportunity and the obligation to undertake to aid in carrying through to full effect the program we are undertaking and have been preparing for so long.

Photography means much to each of us; through participation in the work of our Society we can both contribute to photography and, in so doing, find in it far more benefits for ourselves.

When a Committee Chairman asks you to accept an appointment, think of both sides of it—and accept. Make sure you know what the job calls for and then carry it through to the best of your ability. With all hands on deck and at work there is no problem too big or too tough for PSA to handle.

Mistakes Will Happen!

A silly error crept into the September issue of the JOURNAL after escaping at least three sets of keen eyes. It is, of course, the listing of the Chicago Chapter of PSA as a new member camera club.

Since a PSA Chapter is a part of the Society, it naturally is impossible for one to join PSA. Furthermore, a chapter of PSA is not and cannot be a camera club. It is a special-purpose group of PSA members given a charter to provide worth-while and interesting activities for PSA members throughout their area on a basis that shall not compete in any way with any local camera club organization. Apologies from all concerned for the mistake.

Now We All Know

In the third 1951 issue of *"Photographic Science and Technique"* there appeared a "Special Note for Disinterested Readers" which was intended to determine whether PSA members wished to remain on the PS&T mailing list.

The avalanche of mail which followed was both proof enough of the esteem in which this technical supplement to our JOURNAL is held and as high a compliment to its editor as anyone could desire.

It all makes especially timely two major points. The first is that PS&T is not the supplement of the Technical Division but rather the technical end of PSA JOURNAL which is edited by representatives of TD. It is not only for the benefit of the whole Society but a valued contribution to photography throughout the world. As a builder of PSA prestige, it is perhaps our strongest force.

The second is an overdue compliment to Paul Arnold, APSA, who has borne the burden of the editorial task. He has done an outstanding piece of work for PSA, and I take great pleasure in thus publicly thanking him and offering him the grateful compliments of the entire Society.

We are all most grateful to Keast Burke, APSA, ARPS, our Honorary Representative in Australia and the editor of the *Australasian Photo-Review*, and to Fred Bowron of the Christchurch Camera Club for the most interesting lead story in the March issue of the A.P.R. Mr. Bowron wrote the four-page story of the Baltimore Convention which Mr.

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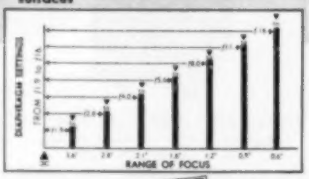

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It is gratifying to know that our friends in Australia have so much interest in PSA—gratifying and also a challenge to justify that interest.

NORRIS HARKNESS, APSA, *President*

ELECTION COMMITTEE REPORT

Chairman Thomas T. Firth, APSA, of the Elections Committee has reported to the Board of Directors the following vote in the election of the Eastern Director: for W. H. Savary—254; for Doris M. Weber, APSA—1041. Miss Weber was declared elected.

Secretary S. P. Wright was directed to cast a single vote for the unopposed election of the remainder of the slate.

LETTERS TO THE EDITOR

Club Fotografico De Cuba
La Habana, Cuba

TO THE EDITOR:

I have just finished reading the September issue of the PSA JOURNAL and I take pleasure in expressing my appreciation for the many fine articles and the photographs which are included in this number.

I also like the idea of having the personal items in the last few pages of the JOURNAL, on different paper, and as a separate division. Thus the members that want to bind their JOURNALS can take off that part, which after all only carries items of temporary interest, and bind only the important part of the JOURNAL.

I believe the September number the best that has been put out as a regular monthly number and I do hope that you shall be able to continue to improve the JOURNAL for the pleasure and satisfaction of those who really love photography and the PSA.

ANGEL DE MOYA, APSA

Stockport, England

TO THE EDITOR:

Many thanks indeed for publishing my letter of the 16th June last—am pleased to say that I am now in possession of the articles I wanted.

I would like to say that I was very delighted with the response to my letter and also the goodwill shown by your readers and the National Carbon Company—it made America seem 'just next door.'

WILLIAM D. HARVEY

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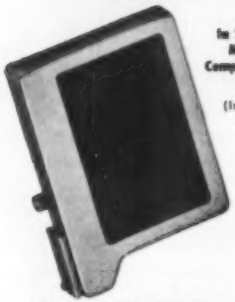

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The 1951 PSA Honors List

THE 1951 PSA Honors List was announced at the Annual Honors Banquet, Book-Cadillac Hotel, Detroit, Michigan on Saturday, October 13th. John W. McFarlane, FPSA, Chairman of the Honors Committee presented certificates to one Honorary Fellow, three Honorary Members, twenty-seven Fellows and seventy-four Associates. Mr. McFarlane expressed his appreciation to the members of the National Honors Committee, as well as the Divisional Honors Committees. The list of the recipients and their citations follow:

HONORARY FELLOWSHIP

EDWARD WESTON, Carmel, California
For his matchless contribution to American photographic art.

HONORARY MEMBERSHIPS

JOHN G. MULDER, FPSA, Rochester, New York
For services to the PSA during his term as President.

GLENN E. MATTHEWS, FPSA, Rochester, New York
For his contribution in photographic chemistry and also in the photographic editorial field but mainly for important services to the PSA.

DR. E. P. WIGHTMAN, FPSA, Rochester, New York
For many years of diligent service to PSA and for many other photographic contributions in the field of research and publication.

FELLOWSHIPS

FRANK ROSS ALTWATER, Pittsburgh, Pennsylvania
For outstanding achievement in pictorial, commercial and technical photography.

J. ELWOOD ARMSTRONG, Detroit, Michigan
For unique contributions as a teacher of photography and achievement as a pictorial photographer.

AXEL BAHNSEN, Yellow Springs, Ohio
For outstanding achievements as a pictorial photographer and for teaching amateurs.

A. D. BENSUSAN, Johannesburg, South Africa
In recognition of unique contributions to amateur photography in South Africa, particularly as an author, lecturer and teacher.

ISADORE ARNOLD BERGER, Detroit, Michigan
For photographic service to his fellow men, particularly during the war; for excellent organizational work.

ANGEL DE MOYA, Havana, Cuba
For unselfish devotion to the cause of amateur photography in Central America and for pictorial excellence.

RALPH M. EVANS, Rochester, New York
For his exceptional services to color photography through research directing, writing and lecturing.

RALPH E. FARNHAM, Lyndhurst, Ohio
For pioneering contributions to photography in the development of new light sources.

FRANK E. FENNER, Barrington, Illinois
For outstanding editorial work in the photographic magazine field and for unselfish devotion to PSA.

JOSEPH S. FRIEDMAN, Johnson City, New York
For outstanding contributions to photographic technology, notably as a writer and lecturer.

H. LOU GIBSON, Rochester, New York
For notable photographic advances in the fields of medicine and nature, and for generous and effective service to PSA.

BARBARA GREEN, Brooklyn, New York
For her services in the promotion of photography and outstanding ability as writer and lecturer.

SHIRLEY M. HALL, San Marino, California
For his services in the promotion of photography and his outstanding ability in pictorial photography.

HAROLD C. HARSH, Binghamton, New York
For contributions to photographic progress by research and development on photographic materials.

OLGA EMMA IRISH, Brooklyn, New York
For exceptional achievement in pictorial photography and for lecturing, teaching, and judging.

JOHN A. LEERMAKERS, Rochester, New York
In recognition of his contributions to the technology of photography, particularly in the field of emulsions.

CARL MANSFIELD, Bloomingdale, Ohio
For excellent photography, particularly of children.

HENRY M. MAYER, Cleveland, Ohio
For long and valuable service to nature photography.

FRITZ W. H. MUELLER, Binghamton, New York
In recognition of exceptional contributions to photographic technology, notably in the improvement of photographic emulsions.

JOHN G. MULDER, Rochester, New York
For his effective and unselfish part in building PSA into its currently strong position, for his photographic proficiency and other contributions.

KONSTANTIN PESTRECOV, Rochester, New York
For his extensive research and direction of research in the field of optical design.

MARION E. RUSSELL, Rochester, New York
For unique contributions in the field of photographic sensitometry and for organizational work in establishing American standards for films and papers.

BERNARD G. SILBERSTEIN, Cincinnati, Ohio
For his lasting contributions to photography through writing, lecturing and teaching.

ADRIAN L. TERLOUW, Rochester, New York
In recognition of devoted service as lecturer, writer and organizer.

DR. G. THOMAS, Bangalore, India
For outstanding achievement and organization and zealous promotion of photography.

ADRIAN P. H. TRIVELLI, Rochester, New York
In recognition of a life-time service and devotion to microscopy and research on photographic sensitivity.

H. W. WAGNER, Worcester, Massachusetts
For his inspirational leadership in pictorial photography and for contributions as a teacher.

ASSOCIATESHIPS

BERNARD M. ACOSTA, Saranac Lake, New York
For exceptional ability as a pictorial and portrait photographer.

HENRY W. BARKER, Glenbrook, Connecticut
For promotion of amateur photography in New England.

A. L. BLIVEN, Omaha, Nebraska
For educational, pictorial and organizational work.

FRED BOND, Los Angeles, California
For his helpful books, lectures and judging.

LAVERNE L. BOVAIR, Detroit, Michigan
For organizational and promotional services to photography.

JAMES S. BRADFORD, Philadelphia, Pennsylvania
For photographic ability and organizational activities.

EVA L. BRIGGS, Detroit, Michigan
For pictorial achievement and services to photography.

EUGENIA BUXTON, Memphis, Tennessee
For organizational services and pictorial ability.

CHARLES J. CARBONARO, Cambridge, Massachusetts
For achievement in motion picture photography.

JOHN P. CARNEY, Griffith, N.S.W., Australia
For pictorial ability and organizational services.

DR. A. E. FRASER CHAFFER, Sydney, Australia
For promotional and educational services and photographic ability.

C. F. COCHRAN, Chicago, Illinois
For educational and promotional services to photography.

CHARLES H. COLES, Richmond Hill, New York
For contributions to photographic education and technology.

LYALL F. CROSS, Wyandotte, Michigan
For pictorial proficiency and organizational work.

C. R. DAILY, Hollywood, California
For technical advancements in motion picture photography.

LEOPOLD ECKLER, New York, New York
For photographic research and technology.

CONRAD R. EMANUELSON, Chicago, Illinois
For promotion of photography and pictorial achievement.

MERLE S. EWELL, Los Angeles, California
For his club work, promotion of exhibitions, and judging.

WILLARD H. FARR, Chicago, Illinois
For many services to nature photography as teacher, lecturer, writer, and photographer.

ROBIN F. GARLAND, Rochester, New York
For contributions as a consultant to photo journalists.

GRETCHEN H. GOUGHNOUR, York, Pennsylvania
For education in and promotion of photography.

HARRY HAIMES, New York, New York
For judging and lecturing, helping others, and his exhibition work.

PETER HANSELL, London, England
For contributions to medical photographic education.

LARRY D. HANSON, Minneapolis, Minnesota
For services in promoting photography and ability in color photography.

VICTOR HASSELBLAD, Gothenburg, Sweden
For organizational services and photographic technology.

LAWRENCE D. HIETT, Toledo, Ohio
For ability as a nature photographer, teacher, writer, and lecturer.

THERON T. HOLDEN, Rochester, New York
For photographic, educational and organizational services.

GEORGE HORN, Woodside, Long Island, New York
For educational, organizational and promotional services.

HERBERT JACKSON, Signal Mt., Tennessee
For photographic organizational services in Tennessee.

LEE JENKINS, Columbia, Missouri
For contributions to the field of nature photography through writing, teaching, and lecturing.

S. D. JOUHAR, Middlesex, England
For services to photography and pictorial ability.

T. KASINATH, India
For organizational and educational services in India.

MARGUERITE E. KYLE, Columbus, Ohio
For promotional activity and for ability in motion pictures.

FRED C. KIRBY, St. Louis, Missouri
For organizational services to photography.

HAROLD A. LARSEN, Hamilton, New Zealand
For his camera club and other organizational work, and for pictorial merit.

JOHN J. LAWSON, Toronto, Canada
For his help to others and his pictorial proficiency.

WELLINGTON LEE, Bronx, New York
For his leadership in Chinatown and photographic proficiency.

LEO S. LERCH, New York, New York
For lecturing, judging and exhibition work.

WARREN W. LEWIS, Chicago, Illinois
For services to photography and pictorial achievement.

K. LINDENBERG, Gothenburg, Sweden
For promotional and educational services and photographic ability.

NORMAN C. LIPTON, Brooklyn, New York
For services through editorial work and promotion of photography.

MAURICE H. LOUIS, New York, New York
For organizational and educational services to photography.

CORTLANDT F. LUCE, JR., Atlanta, Georgia
For pictorial ability and promotion of photography.

JOHN H. MCLEOD, Rochester, New York
For contributions to photography through research and publication.

BEAUMONT NEWHALL, Rochester, New York
For his contributions to the history of photography.

RACHEL M. OSGOOD, Chicago, Illinois
For pictorial ability and promotion of photography.

HAYWOOD PARKER, JR., Pittsford, New York
For research and education in the photographic field.

HERBERT P. PASCHEL, Woodside, Long Island, New York
For photographic education in the graphic arts.

LEO PAVELLE, New York, New York
For contributions to photographic technology.

GERDA PETERICH, Rochester, New York
For teaching, lecturing, exhibiting, and dance photography.

WALTER J. PIETSCHMANN, Detroit, Michigan
For services to beginners and organization in photography.

HARRY R. REICH, N. Tonawanda, New York
For educational and organizational services and ability in nature photography.

FRANK E. RICE, Chicago, Illinois
For organizational work, exhibiting, and documentary photography.

LOREN M. ROOT, Chicago, Illinois
For services to photography through organizational work.

EDGAR J. ROUSE, Sydney, N.S.W., Australia
For contributions to photographic technology, promotion and organization.

WILLIAM H. RYAN, Cambridge, Massachusetts
For contributions to photography through inventions.

WARREN H. SAVARY, Plainfield, New Jersey
For color photography and organizational services.

HUBERT SCHEFFY, Rochester, New York
For photographic education through publications and service to PSA.

GEORGE SCHWARZ, Glen Head, Long Island, New York
For contributions to photographic technology, particularly in the emulsion field.

EMMA SEELY, Cleveland, Ohio
For proficiency in motion picture photography of birds and for educational contributions.

LARRY SHERWOOD, Kansas City, Missouri
For progress in motion picture production and aid to others.

BARBARA STANDISH, Boston, Massachusetts
For organizational work, publication, and photographic proficiency.

GEORGE E. STONE, San Jose, California
For educational motion pictures, lecturing and research.

MORTON STRAUSS, New York, New York
For lecturing and judging, and for exhibiting prints.

WILLIAM F. SWANN, Rochester, New York
For educational contributions to scientific photography.

MAURICE TABARD, Paris, France
For ability in creative photography.

SILAS M. THRONSON, Milwaukee, Wisconsin
For organizational services and photographic education.

FREDERICK A. TIETZEL, Columbus, Ohio
For creative color photography, slides exhibited and lectures.

ERNEST TO, Hong Kong
For organizational work in Hong Kong, editing, and pictorialism.

ROBERT H. UNSELD, Wilmette, Illinois (Deceased)
For advancement of amateur motion pictures, by example, by editorial and by other work.

JULIUS WEBER, New York, New York
For his contributions to medical and scientific photography.

LOT S. WILDER, Rochester, New York (Deceased)
For research and development of processes in color photography.

PAUL J. WOLFE, Butler, Pennsylvania
For pictorial ability and educational services to photography.

GEORGE P. WRIGHT, Winthrop Harbor, Illinois
For photographic achievement and services to photographic technique, education and organization.

THE 1951 PSA CONVENTION— A REPORT FROM DETROIT

THE DETROIT Convention actually began at Baltimore when plans were laid for the big 1951 event. How good those plans were and how well Detroit's famous mass production works were demonstrated when the 1951 attendance passed all previous marks with a total of 1,186.

Thirty-four states together with the District of Columbia, Canada, Cuba, Finland, France, Italy, and Mexico were represented. But those are only part of the "big figure" department. The preparations included supplying 16 still and movie projectors, seven screens, 500 feet of extension cords plus innumerable spotlights, signs, tape recorders, stage props and all the rest of the smaller bits that make up a convention jigsaw puzzle. Mass production entered the picture again for each of the field trips. It required fourteen busses for the Greenfield Village tour and twelve for the barbeque in Windsor, Canada. Seven hundred fifty attended the banquet. The Committee's job was a big one and ably handled.

Downtown Detroit as seen from a U. S. Air Force photographic plane before the "Parade of Firsts" on Friday evening.

Michigan supplied 368 PSA'ers with New York in second place with 158, Ohio in third with 117, and Illinois in fourth with 116. Pennsylvania sent 46, Indiana and Iowa 26 each, and Wisconsin 24.

There were 58 program events varying from specialized groups to general meetings with something going on from 9:15 AM to eleven at night—and most of the time, the choice of which event to attend was most difficult. But that was not all of this Detroit Convention: its serious and educational side was equalled by its friendliness and genuine enthusiasm for photography and the importance of PSA's contribution to its progress.

Special mention must be made of the great contribution made to PSA and its Convention by the Air Force, as personified in Col. George W. Goddard and his staff. Their exciting exhibits of aerial photography and equipment climaxed by the thrilling demonstration on Friday evening provided unforgettable high-points. Detroit was a big show and sets a standard for a PSA Convention that will be difficult to surpass.

Early in the Convention the Registration desk was the busiest place in town.

Chow time with the Detroit skyline in the background. By now, everybody was too hungry to care about pictures.

The Bonny Lassie had a busy couple of hours. Half of us wanted portraits, half wanted action. We all did OK.

WE WENT PLACES!

Wednesday's National Council Meeting broke up fast in order for all hands to travel "South of the Border" (yes, you really go south from Detroit to Windsor, Ontario) for a shooting session and a barbeque. A dozen busses carried 450 of us from the Book-Cadillac across the lovely Ambassador Bridge to the park from which 7,659 shots were made of Detroit's skyline. It is estimated that another 3,482 exposures were made of the girl with the Scottish band and almost that many of other photographers making pictures (?) of other photographers. . . . After the barbeque, we all came home again through the tunnel.

On Thursday we made more use of the perfect Detroit weather to visit Greenfield Village in Dearborn. The village is Henry Ford's restoration of buildings important in the early days of American history. Its wide grounds and splendidly arranged buildings—seemingly made for the photographer—gave us three hours of intensive activity, making shots outdoors as well as in the old stores and the other replicas of what used to be. Color slide exhibits and salons will soon show what we did there.

With more of the same weather—it is rumored that Col. Goddard knows the weatherman—we revisited the exhibit at the Institute of Arts and then stopped off at the Historical Society. The picture opportunities were unlimited and at times almost every case had a camera using it as a tripod.

The fortunate fifty who did not have to work—excluding the less happy fifty who did—spent most of Sunday at Cranbrook twenty miles out of town. The architectural details and the long vistas were excellent material except for one fault that will keep the retouchers at work for a long time. At the end of nearly all the most exciting, sweeping views we found water towers. Architects should be more considerate!

Darkroom widows enjoyed conducted shopping tours and visits to Detroit's points of interest, decked out with special decorations in honor of PSA (?) and Detroit's 250th birthday celebration.

The first man in line—and the rest of us failed to get ahead of him!

Walter J. Pietschmann speeds up service.

At last! Rumor is that Ralph Gray got seconds.

The Ford Plant

Thursday morning a look-see trip, no pix. The assembly line was very impressive and we were surprised to learn from Ed Purrington that you can't make cars without photography. Lunch at Dearborn Inn relieved both empty stomachs and tired feet. Everyone was in agreement that the walking trips might be good for the figure but they had better be at the beginning of the convention.

Those who stayed for the Thursday morning programs at the Book-Cadillac and those who went on the Ford tour joined forces to spend the afternoon at Greenfield Village. One of the guides remarked that cameras outnumbered the exhibits.

The Ford plant was interesting—but they wouldn't let us take pictures!

Good models make good photographers —and PSA'ers know it.

Nature experts turn engineer in hopes of discovering a new system of agitation.

Old architecture with and without added action filled most of the afternoon at Greenfield Village.

One's attitude toward photography is important.

Mr. and Mrs. Harry K. Shigeta check up on antiques at the old watchmaker's shop at Greenfield Village.

We journeyed to the plush auditorium of the Detroit Institute of Arts for the presentation of the PSA Progress Medal by President Norris W. Harkness, APSA, to Colonel George W. Goddard (right), chief of the Air Force Photographic Laboratory at Dayton, Ohio. After the presentation Col. Goddard delivered a lecture, illustrated with three-dimensional slides and film one mile long and eighteen inches wide, which is capable of photographing the State of Pennsylvania in five hours. Col. Goddard showed some of the equipment and a number of pictures of the damage done by the Air Corps during the last war and in Korea.

A PARADE

On Friday night a succession of program events staged by Tom Miller, APSA, held entranced a capacity audience in the ballroom of the Book-Cadillac Hotel. Yousuf Karsh led off with an informal talk on his system for making portraits; his first lecture before a nonprofessional audience. As he talked about his pictures his listeners thrilled to his revelation of how he goes about recording for posterity the character and personalities of the people who make history.

Next Col. George W. Goddard and his U. S. Air Force crew teamed up with L. A. Thompson, chief engineer of Acme Telectronix, and his gang to demonstrate for the first time in public the technique of transmission of aerial photographs. At 9 o'clock sharp the audience watched through the windows while an Air Force plane made two runs shooting pictures of the Detroit riverfront with flash cartridges.

Later the photos were transmitted by radio to the stage where the audience witnessed the actual operation of the receiving equipment. Simultaneously, the same picture signal was relayed by telephone line to the nation-wide Acme Telephoto network and was received in the offices of the nation's largest newspapers. The technique demonstrated has been in use in Korea where it greatly speeds up the process of supplying tactical information.

THE ANNUAL PSA AWARDS

G. L. Weissenburger receives his Oscar from Doris M. Weber as one of the top honor winners in the finale of the Print-of-the-Month Contest.

The names of the winners of the various awards of the Society are one of the most prized secrets up to the moment of their being given at the Convention. Those so honored this year were:

The *Clerk Maxwell Award,* presented by Paul J. Wolfe, APSA, to C. P. Taylor.

The *Stuyvesant Peabody Award* presented by Robert L. McFerran, APSA, to Harry K. Shigeta, Hon. FPSA.

The Technical Division's *Journal Award* presented by Dr. H. C. Carlton, APSA, to E. B. Noel and P. B. Davis.

The *Color Division Medal* presented by George F. Johnson, APSA, to Leonard Thurston.

A Motion Picture Division certificate presented by Vincent H. Hunter, APSA, to Harris B. Tuttle, FPSA.

Print-of-the-Month Contest Oscars to G. L. Weissenburger, APSA, Everett W. Saggus, and Charles Buker and certificates to Masaru Taketa, Chester W. Hodgson and Chester A. Smith.

PSA Service Medals were presented by Norris Harkness, APSA, to Walter E. Parker and Owen K. Taylor.

Retiring President John G. Mulder, Hon. PSA, FPSA, was given an ornamental gavel inscribed: "To John G. Mulder with the affectionate thanks of the members of PSA for his so effective efforts in their behalf."

OF FIRSTS

L. W. Chubb, Jr., Polaroid Corporation research engineer, took a film packet which had been exposed in a standard X-ray machine in the usual way, and ran it through a pair of steel rolls in a box no larger than an overnight case. A minute later he removed the completed X-ray picture.

Charles Kunz, of the Eastman Kodak Company, demonstrated rapid reversal processing of 16mm motion picture film. A roll of film exposed during the early part of the performance was handed to Mr. Kunz and 10 minutes later it was projected before the audience. Another demonstration by the Eastman Kodak Company was a colorama that displays one picture by reflected light and another by transmitted light.

A crew from the Haloid Company demonstrated their new Xerox process which permits positive reproduction from either negative or positive microfilm originals. Within a few minutes after receiving the original positive they had produced multilith plates and were printing souvenir news releases telling about the program.

The finale of the program was the first public demonstration of the Baldwin Photoelectric Organ, a new instrument made possible by high resolving power photographic plates that control tone and pitch to match the results of organs with real pipes.

It was a truly inspiring evening.

Lewis W. Chubb, Jr., Polaroid Corporation research engineer, exhibits X-ray and machine with which he developed the picture in only sixty seconds.

The miracle machine that processes movie film in a minute and delivers dry film ready for the projector at five feet each 60 seconds.

Colonel George W. Goddard arrives in town with his camera crew to be greeted by Eva Briggs, Publicity Chairman of the Convention Committee.

THE PROGRAM

Lectures, demonstrations, quiz programs and clinics featured the four-day program. Everyone found something to his taste. The problem at times was to decide what of the dozens of things to take in, but there was much less of this than in the past because of careful scheduling.

The program started at the same time as registration with a symposium on industrial photography. At 9 o'clock in the morning 175 people were gathered to listen to men from General Motors Photographic Division, the Ford Motor Car Company, North American Aviation, the Naval Ordnance Lab., University Microfilms, and the Eastman Kodak Company discuss the practical side of industrial photography. On Thursday this theme was continued by a visit to the Ford plant where more than 200 delegates saw cars being made and listened to Edward S. Purrington tell about his photographic work at the Ford plant.

Portrait Making

The pictorialists got under way on Thursday morning when Olga Emma Irish demonstrated how to make portraits of people like you and me. Print makers were served a treat in the afternoon when a panel of experts analyzed a wide variety of pictorial prints. The color and the nature group joined to hear Mr. Savary talk about long focal length lenses in bird photography.

In the evening in the Grand Ballroom standing room was at a premium for a showing of the film "Karambi" made by E. J. Hurd and a demonstration of color composition by Fred Bond.

Friday morning saw the initiation of a new idea in programs, the Johnny Appleseed Program. Johnny and his six bucolic assistants in native costume took on all comers in a quiz program. Serious discussions of problems from the audience were interlarded with dramatic demonstrations of everything from how to get the brother-in-law of the president of the company out of the picture to a new device for lighting cigarettes by radio control. The consensus is that the new idea provides a program that is at once educational and entertaining.

Feature of the Pictorial Division program was the Friday nite lecture on portraiture by the noted FPSAer, Yousuf Karsh.

In the afternoon the pictorialists watched a gang from Detroit put on their "Big, Blue and Glossy" demonstration. Now there is nothing secret about the blue toned print for those who were at that meeting. Maurice Tabard then had everyone's head swimming with new ideas while he discoursed on Creative Photography.

At the same time the color and the technical groups joined in a two-hour quiz clinic on color. Harsch of Ansco, LaClair from Grand Rapids, Lerner of the Tricorn Press, Thaxton of the Thaxton-Simmonds Labs. and

George Hoxie as Johnny Appleseed hands out apples during the program break.

Olga Emma Irish and her model both seem pleased with the lighting effect during her demonstration on portraiture.

"Big, Blue and Glossy," a demonstration with Dr. Victor A. Lookanoff at the roller, Earle W. Brown on the left and LaVerne L. Bovair on the right.

Johnny Appleseed's gang—Ade TerLouw, Johnny himself (as portrayed by George Hoxie), Vince Hunter, Lou Gibson, Adolf Fassbender, Art Underwood and Dave Eisendrath.

Colton of Kodak were on hand to clear up the color problems of the audience of several hundred. Discussion of color problems continued in the color slide clinic conducted by A. C. Klein. The movie folks had an afternoon of clinics—Equipment and Preplanning by Dean Coffin, and Shooting Your Movies by Charles Dennis of Wilding Pictures. The PJ group heard Dione of the Detroit *Times*, Dumke of the Milwaukee *Journal*, and McEvoy of *Life* discuss News and Magazine Photography. The Michigan State Police Crime Laboratory followed with a demonstration of their use of photography.

Friday evening was quite an affair with Yousuf Karsh and the variety show, Photography Comes of Age. More about that in another place.

Saturday was a busy one. Affairs of the Division, portfolios and the monthly Print Contest Finals—kept the pictorialists busy until the latter part of the afternoon when they joined the Color Division to watch Maurice LaClair put on a down-to-earth demonstration of Lighting for Color Portraiture. Earlier in the day the color group witnessed a never-to-be-forgotten showing of Helen Manzer's color slides on Unbelievable Utah. The Movie Division had more clinics—Errors, Editing and Titlers, and Music, and enjoyed Ray Eggerstad's film Down the Mighty Colorado. Common Errors of Subject Handling and TV and News Coverage discussed by Tom Waver of WXYZ-TV finished up the program of the PJ group.

The Technical Division had a full program. They scheduled 17 papers to be given in 15 program hours. Topics were varied—High Speed Movies, Exposure Meters and Exposure Determination, Mirror Lenses, Electronic Flash Circuits, BC Flash Circuits, Tone Reproduction, Navy Photography.

All in all it was quite a program.

The three large ballrooms of the Book-Cadillac Hotel were hardly large enough to hold the crowds at the meetings. Attendance was high right up to the last even though everyone agreed that Book-Cadillac chairs were the hardest they had known.

We All Had Fun

But Some Worked Too

Thanks to Walter J. Pietschmann, Harvey Croze, The Detroit *Free Press*, The Detroit *News*, Acme News Service and The U. S. Air Force for the pictures of the Convention.

NEW YORK FOR YOU IN '52

"THE PHANTOM SHIP." This is a reflection purposely turned up-side-down to make an abstraction. Using the panel has enabled us to eliminate the unwanted part of the boat that made the reflection. Presented right side up in its entirety, this would be just another reflection.

Panels Are Pleasing

WORDS AND PICTURES BY KARL A. BAUMGAERTEL, APSA

PROBABLY because they are a little difficult to present on the standard vertical 16 x 20 mount, the making of panels has been almost completely neglected by monochrome exhibitors. Certainly the panel format is capable of charming arrangements of picture material, and as color slide exhibitors do not have the same limitations (and inhibitions) that black and white workers have, they can and should use the panel shape. As examples, we have selected two prints that are far more effective as panels than they would be in the usual format.

"SILVER HAVEN." The panel here eliminates an unpleasant shape in the foreground and a distracting saw-tooth roof line. The panel format is often very effective in keeping out unwanted objects in a picture.

Filming Under Difficulties

VLADIMIR KOZAK *

MY HOME and filming activities are centered in South America. I thought that it would be interesting to the movie makers in North America to hear of some of the experiences we have to the south of you and of some of the difficulties that are encountered in making pictures in the great open spaces of Brazil.

In the United States, it's possible for you to go into any photographic store, of which there are several in every city, or in the corner drug store, and buy a roll of film of your choice. If it's exposed the same day and sent off for processing by first class mail, the chances are that you will have the film back to look at within less than a week.

In South America we do not have it quite as easy as this. First of all, dealers may not carry the kind of film that you want, nor have it in the kind of packing, magazines or rolls that are needed for your camera. When we send a roll of film for processing to the United States, particularly color film, several weeks and sometimes months elapse before it is returned to the user.

When we go out into the countryside or jungle areas on a photographic expedition, there are no stores in the small communities that carry film so every bit that is needed must be anticipated in advance and taken with one on the journey.

Whenever I read an article on filming, written by people in the United States, I like to know something about the obstacles that they have met in making their films, and how they surmounted them.

The hard work and hardships involved in making an expedition film are all relative. The unconquerable of yesterday would seem easy today. Movie making is like the old axiom, "The huge boulders that loom up in front of us today, turn out to be only pebbles once we pass them on our way."

Recently, I read an article in a magazine of how an amateur movie maker got extremely mad when he couldn't get the film he needed for a trip that he planned for some time. I'm wondering what that same amateur would say if he had a movie camera and his local dealer did not have any film supply for two or three years at a time.

When moving on the dry part of the land, from one camp to another, we used a small two-wheel cart. During the flood season, the only means of transportation is a canoe.

For a long time, I had been planning to make a trip to the Mato Grosso. This is an area called the Pantanal, situated close to the Bolivian border, somewhat off the beaten track, where I expected to find some interesting motion picture material.

I knew I would need all the film I could get and so I started to accumulate it from practically all over the world for nearly a year and a half ahead of time. Films came in one by one, a few from New York City, a few from Canada, a few from Los Angeles, a few from Europe—some of them had already expired before I was ready. I was also fortunate to get some outdated film in São Paulo and in Rio de Janeiro.

The price of locally purchased film would surprise even some of the persons who were accustomed to the black market prices charged for meat in the United States during the war. As a rule, we usually pay at least twice the regular U. S. purchase price of the film. For a 100 foot roll of Kodachrome, we usually pay twenty to twenty-five dollars or the equivalent in American money.

Now as to the personal outfit needed for this expedition. There are no houses or huts in the wilderness, so you have to take along practically all the things that you'll require.

Because of the bugs, mosquitoes, and frequent thunder storms, a substantial tent is a must. Occasionally, it is possible to stay overnight at a small farm. The people are friendly and always have hooks on their veranda or in a back shack where you can hang your hammock. And you must have a mosquito net to put over that. The tent, of course, requires a camp cot instead of a hammock, or a convertible hammock-cot can be used.

* Caixa postal 236, Curitiba, Parana, Brasil. A Czech, born in Moravia, about 55 years old, Mr. Kozak left the country some 25 years ago with his sister, and now works in Brazil (for Electric Bond and Share) hunting up sites for power and electricity development, making long arduous trips into the interior. Is credited with the discovery in 1940 of the Gruta da Fada (fairy grotto or cave), etc. Has had stories published in Brazilian magazines, and his pictures comprised over 25 per cent of those used in compilation of the copyrighted engagement book—a page for each week, faced by a picture—published by the Stranger's Hospital in Rio de Janeiro, 1950, for the ensuing year.

This would mean extra equipment and since I was limited in the amount of equipment I could take along, I decided that I would construct a convertible hammock-cot. We needed two of them because my sister was going along to act as camp cook and help in whatever way she could during the expedition. The convertibles were at last completed and later proved to be the two most important items of our equipment.

The cook needed some kind of kitchen utensils. These

The birdseye view of the Yguacu waterfalls is the best introduction to this fable spot, which is at present quite easily accessible by regular Pan Air route.

were provided by Abercrombie & Fitch Co. of New York City, who supplied us with a wonderful assortment of cooking equipment.

Since we could not carry a large amount of canned food with us, I patched up an old gun to use for hunting. We outfitted ourselves with a sufficient supply of cartridges to take care of any emergencies, also sufficient fishing equipment to use when needed.

For transportation in the swamp region of the Pantanal, it seemed to me that an outboard motor was a must, but folding boats were an even greater necessity. When we were finally prepared and completely outfitted for the trip, I had over 1,000 pounds of baggage.

During the time I was collecting the gear, a great many letters had to be written to people and friends in the region where I planned to go. It was necessary to get permission from them to pass through their territory or stay on their land.

Actually, this was a long and tedious job, because by the time you got answers you had to write again and further explain your plans, then hear from them again, with two or three months, sometimes more, elapsing.

We had started planning the trip nearly a year and a half in advance and had gotten down to the serious work of accumulating materials about six months before our date of departure, which was around the second of September.

It was the spring season in this country, which is just the reverse of your seasons in North America. But the heat was very trying, and it probably seemed even hotter than it was with all the pieces of baggage that needed looking after and handling when we changed from one type of transportation to another.

After four days of broiling in a bus and train, we reached the Paraguay River, and the following day we were rolling over the dry places in the Pantanal area. Perhaps I should say that it was our equipment and baggage that got the ride, as we walked behind the loaded ox carts that carried it.

We nearly melted, and it seemed as though the film in the camera had done the same, because it refused to run. At noon, we would rest for an hour or two in the shade of a tree, and the oxen were willing to stay there for the rest of their lives.

Late in the afternoon, we reached the hut of some friendly cowboys. We accepted their hospitality and had a delicious meal of dry meat and maniok and some Matte Tea. Such a meal is the staple food in this region, day after day, year after year, with no change in diet. However, we were delighted to enjoy the friendship and hospitality of these cowboys and even had the luxury of a bath. There was a waterhole in the cattle coral where there was a grand place for washing. No one would believe what such a waterhole could mean when you get really thirsty and dirty and tired after a long day's tramp on dusty roads. That night we slept in a shed adjoining the cottage. It was merely a roof supported on logs made of Caranda palm trunks, without any kind of wall or fence, the most perfect ventilation imaginable.

I had no sooner started drowsing off to sleep, when something hit me hard underneath, below the hammock. I jumped up and found that a group of pigs had run through the shack, apparently resenting our intrusion. I retied my hammock, raising it so that it was a little higher off the ground and when I got back into it, the first thing I knew I was on the ground again, the rope having broken.

In the distance there was the rumbling of an approaching storm. The deep murmur of thunder seemed to send an advance notice of cooler air to come as I dozed off to sleep from pure exhaustion.

I was awakened suddenly with a tremendous burst of

A Special Feature on Motion Picture Photography

a gale that flogged the hammock in which I was sleeping like the lash of a whip.

The perfect ventilation of the shack worked wonders. The wind was carrying clouds of dust and sand, not only through the shack, but also right through the mosquito netting covering my hammock. Not only the hammock, but my eyes, ears and mouth were full of dust before I had a chance to get up and protect myself.

I did not mention before that the mosquito net not only protects one from mosquitoes and bugs, but also against bats which are always a danger to the traveler. The small specie are the blood-sucking type that go for human beings, while the larger bats that do suck blood attach themselves to horses, mules, and other types of animals. It is difficult to tell which type of blood a bat will prefer. Some of the larger ones have been known to attack human beings. Therefore, it's preferable to always protect yourself when you're sleeping with a net that the bats, either large or small, cannot get through.

The wind and storm traveled straight across the shack, blowing all of our personal belongings in every direction. The rain was a horizontal deluge.

In a few moments, we were shivering with the cold that came with the rain. Spiders, cockroaches, and other bugs that were blown out and down from the thatched roof tried to hide in the hammock. We were certainly glad to see daybreak and by then the rain had stopped, and we packed our belongings, as wet as they were, in preparation for continuing our journey.

After a breakfast of Matte Tea, dry meat and maniok, we loaded our ox-driven cart and pulled out. The sky did not clear; it remained overcast with a chill in the wind all day.

Eventually, we reached an area where I thought it would be well to camp for a few days to get our bearings. We found a spot near a creek, where water was available. In going to the edge of the creek to examine the condition of the water, there fresh in the mud was clearly outlined the large footprints of a jaguar. Apparently, he was a big fellow and would not be too friendly if come upon suddenly.

We set up our tent and made camp in the dense palm undergrowth, only a few yards from the beach to the creek. Here crocodiles were crawling about and basking in the sunlight. These crocodiles, by the way, are interesting subjects for your movie camera.

Before our tent was completely erected, a sudden flash

Top—Wild cattle, the "bagua," used to be an important economic factor of the country. At the present, it's becoming scarce, as it is replaced systematically with improved breeds. Slaughtering of wild steers is a show, which belongs to the pictures of the wilderness; and in spite of the fact the process seems rough, it supplies impressive scenes for your movie sequences. Second—Some crocodiles got used to our presence, and always waited for the fish we caught for them. As they later grew too friendly, we had to chase them away. Third—Wild fowl, like Arancua, Jacu-tinga, wild duck, and Mu-tum, made up part of our menu. Difficult as they were to photograph, they were easier to shoot with a gun. (Left, wild duck; right, Mu-tum.) Bottom—In spite of the fact that the country was flooded for six months, the region gets extremely dry in a couple of weeks, and water, principally drinking water, becomes a serious problem. The oxen teams march for hours in the hot sand.

storm came up and it started to rain. After the first deluge, it settled into a steady downpour. We had to build a fire and cook our supper in the rain.

The first nights in the wilderness are always very impressive. Strange and sometimes horrible sounds scare the life out of you, if you don't know that most of the loud sounds are uttered by very small animals or birds. But the mornings and the sunrises are wonderful. The morning air is clear, cool and invigorating.

Filming is an adventure in itself in such surroundings. One of the first things in order to get wildlife photography is to prepare blinds.

It was not long before we discovered that the creek was full of piranhas as well as crocodiles. The piranhas are the most feared fish of the tropical waters. I thought to myself, piranha or no piranha I've got to wash—so I took my bath in the stream with the crocodiles and piranhas, and I am happy to report that both the fish and the crocodiles stayed away from me and caused no trouble.

Only once was I in any danger and that was when a crocodile slashed me with his tail sharply across the leg, but I am sure that he was more scared than I was, because he got away from me just as quickly as he could.

The piranhas became an important item in our diet, and they are quite digestible when properly cooked.

The next day we ran into another enemy that caused more difficulty than the crocodiles and piranhas. These were the ticks. They were friendly, of course, and the problem was how to avoid them. Usually they were lurking for their prey on the branches of trees and always ready to shower themselves down on prospective victims. They get under the skin and cause continual itching.

When we first struck camp, the crocodiles disappeared for a while, but as soon as they saw no harm was going to be done to them, they got used to us, and grew even persistent and were always trying to snatch off the fish when we got one on the hook.

After several days in this location, we decided to move onward again, and went into the country where large areas were flooded most of the time. Here the ox cart is indispensable. There is an average of three feet of water and mud in many places that extend for miles.

We were lucky again on this move because we passed a farm house where we had the luxury of a dinner of soup and dry meat and beans, maniok, and Matte Tea, and that night we strung our hammocks on the veranda. Beds are unknown and nonexistent in the open spaces of South America.

We proceeded to Viveiro. This is the breeding place

TOP—Bats present interesting subject material for the movie camera. It can be noticed that the spread of its wings is not very far from three feet. SECOND—the most feared fish of the tropical waters is the "piranha." It's very easy to catch, tastes quite good, and it added a variety to our meals. THIRD—It is beyond description to see tropical butterflies in their natural haunts; close-up in color are a must. During the summer time, butterflies can be seen along most tropical rivers. BOTTOM—Flowers, both orchids and cacti, form a pleasant change in the scenes in filming the swamp land.

of the snowy egret, the jaburu storks and other similar birds. This could easily be the naturalist's playground for years.

On the sandy banks of the creek, crocodiles were constantly on the watch, ready to snatch any unlucky young bird who is not cautious enough. And the crocodiles certainly grow fat on their juicy tid-bits.

Our provisions were getting low and we were in need of meat to supplement our diet. I do not like to hunt as a sport but this was a matter of necessity. It's fairly easy to bring down a number of wild birds about the size of a chicken, sometimes even as large as a turkey, which are excellent to eat.

The pond which we used for water was nearly a mile from our camp. Here we had to come every day for a bath and drinking water. There were also very few mosquitoes here, because the area was a lot drier than the swampy area we had visited a few days before.

Unfortunately, we did not see any snakes, in spite of the fact that I was purposely looking for them as subjects for my camera.

A few days later, we did come across two or three snakes, but they were the non-poisonous type. But encountering mosquitoes, ticks and all other things that make living in tropical, swampy regions difficult, is only part of the game. These are things that are to be expected, if you're going to get good motion picture material of wildlife in its native habitat.

You soon forget all about the disagreeable things after spending a little time watching the strange world around you. The gorgeous sunsets over the swamps, the storks and egrets feeding their young in the trees, and the life of the native people, the farmers whom you come across occasionally in your travels, make it worth while.

There are, of course, thousands of opportunities for picture making, but when you're on a trip of this type, and have a limited supply of film along, it's necessary to stop and consider whether you should make pictures of some of the things that seem reasonably interesting, or whether you should wait and see if you will come across something even more interesting tomorrow.

It's only when you return from a trip and have been able to photograph everything that occurred, both of average and great interest, that you can cut out the things that are of less interest on the screen, and make up your final film of the more dramatic events that occurred during your trip. Therefore, it's almost impossible for me to ever make a complete film on any given subject, particularly a complete film on a travel expedition such as I made on this occasion.

Once you get out into jungle regions, practically every type of subject you can think of is available for picture making.

There are beautiful butterflies and birds of all sizes and descriptions, and beautiful wild flowers, orchids, and cacti blossoms. It would be possible for one to keep their camera humming from early morning till late at night when the weather is good. It would be easy to expose 500 to 800 feet of film in a day's time, and not have one inch of uninteresting subject material. However, when you go on a trip such as this for a period of four or five weeks, and have only eight or ten rolls for the entire expedition, you can get some idea of how careful you must be in deciding what to take pictures of and what to leave alone.

In planning my expedition to the jungle it was impossible for me to buy new equipment in the way of movie cameras, lenses, etc. I used the Filmo 70DA which I have owned for nearly twenty years. Four and six inch telephoto lenses are a must in filming birds and wildlife in the wilderness, and, of course, it's necessary to use a tripod with lenses of this focal length.

The main difficulty comes when one gets back home and sends the film in for processing. Since Kodachrome has to be sent back to the United States for development, it requires several months by regular mail before the film is finally processed and returned for editing. Thus, our filming problems down here are difficult, but the joy of seeing beautiful pictures in color on the screen is really worth all of the hard work we go to and all the difficulties encountered.

While I've been trying to point out some of the difficulties which we face here in making motion pictures, I don't mean to imply that all filming in Brazil is really difficult. There are many beautiful places quite easily accessible for most amateurs, even for those who lack the time or for other reasons wouldn't want to go into the jungle and marsh areas for wildlife photography. There are many beautiful scenic views and any person traveling from the States could start in the north and go right through to the south, ending perhaps in the Yguacu to photograph the cataracts and Yguacu waterfalls, which rank among the most picturesque of their kind. The cataracts and waterfalls provide a wealth of beauty and action that would be hard to find any place else in the world. The waterfall is nearly twice as high as Niagara and more than six times its extension. Their beauty surpasses anything I have seen anywhere, but the story that I would like to relate to the readers of PSA JOURNAL must wait until some later time.

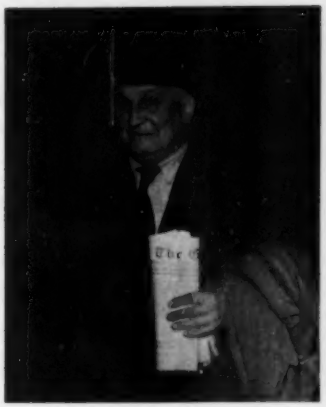
Remember, movies speak a universal language and all of us who love to make pictures will find a way.

ROBERT H. UNSELD, APSA

With the recent death of Robert H. Unseld, PSA and the Motion Picture Division have lost one of the Society's newer but more ardent workers. Like a great many movie makers, Bob became interested in PSA just after the formation of MPD, and appeared on the program at the Oklahoma City Convention. Since that time he contributed materially to the Division's progress by serving as Motion Picture editor for PSA JOURNAL until poor health made it necessary for him to resign this post on March 1st of this year.

After attending elementary and high school in Chicago, Bob entered the University of Chicago in the fall of 1918, and was awarded his Bachelor's degree in 1921. Shortly thereafter, Bob took off to see the world. He hitch-hiked to the west coast, got a job on a Honolulu-bound boat, and landed in Hawaii in 1923. With funds running low, he soon landed a job in the National Bank of Hawaii, and before long held a responsible position as foreign teller. It was during this stage of his life that his love

Robert H. Unseld, APSA



Robert J. Flaherty, FPSA

for movies was born, and he bought his first movie camera and began to document his trip.

After several years in the Orient, the Holy Land, and Europe, he finally rejoined his family and friends in Chicago. In 1935, soon after his arrival, he joined Bell & Howell where he handled consumer service, *Filmo Topics*, and became the company's advertising manager. In 1942 he was called to active duty with the Air Corps, where he served first in the Air Service Command and later as Administrative Chief of the Air Material Command's Photographic Laboratory at Wright Field. In this position he was responsible for the preparation of the Air Corps' aerial photographic exhibits and displays. He held the rank of Major when he was discharged, and he returned to Bell & Howell in January 1946. At the time of his death he was Manager of Amateur Equipment Sales.

Those who had the privilege of having Bob Unseld as a personal friend knew him to be a man of fine character—true, loyal, considerate, dependable. His passing leaves for them a void that cannot quite be filled. Bob loved the fine things of life—the outdoors, nature, companionship. And so it was natural that the wonderful hobby of photography appealed to him so strongly. In it he found the means for documenting the wonders of his travels, the beauty of things around him. Among his films, "Woodland Mysteries" will long be remembered by those who have seen this masterpiece of close-up nature photography. His enthusiasm for this great hobby made it easy for him to write and lecture on a subject close to his heart, and through his articles and camera club appearances Bob became known to a host of movie makers throughout the world.

Certainly Bob's many friends are richer for having known him, and the growing field of home movies has been helped materially by his broad influence and love for the hobby.

ROBERT JOSEPH FLAHERTY

Robert Joseph Flaherty, FPSA, noted explorer and motion picture producer, whose films included the "Louisiana Story," judged the best documentary film of 1949, died at his home in Dummerston, Vermont on July 23, 1951 at the age of 67.

The *New York Times* in an obituary had this to say about Mr. Flaherty:

Although the fireplace of Black Mountain Farm, Mr. Flaherty's home near Brattleboro includes a Celtic motto meaning "Wander No More," its owner succeeded in avoiding that advice during most of his adult life. His journeys to exotic places resulted in a film form that justifiably earned him the title of "father of the documentary."

The creator of such films as "Nanook of the North," "Moana of South Seas," "Man of Aran," "Elephant Boy," and his last feature, "The Louisiana Story," was born in Iron Mountain, Michigan, the eldest of the six children of Robert Henry and Susan Kloeckner Flaherty.

After receiving secondary schooling at Upper Canada College, a preparatory school in Toronto, he spent seven months at the Michigan College of Mines. Later he worked in a Michigan iron mine and helped his father search for Canadian iron deposits, a job the elder Flaherty was commissioned to take by the United States Steel Corporation.

Then came two years of exploration through the Canadian wilds, after which he set himself up as an independent explorer subsidized by the Grand Trunk Pacific Railroad. Then he was introduced to Sir William Mackenzie, who was building the Canadian Northern Railroad.

Between 1910 and 1916 Mr. Flaherty made four expeditions to Canadian subarctic regions under the sponsorship of Sir William, during which he mapped the Baffin Land, northern Ungava and the Belcher's Island areas. In appreciation, Canada named one of the Belcher's Islands for him.

Determined to produce a film about Eskimos, Mr. Flaherty obtained backing from John Revillon of Revillon Freres, the fur company, and returned to Port Harrison in "the barrens" country of Northern Canada, where he found his hero, Nanook (meaning "The Bear"). During 1920–21, he filmed the feature released in 1922 as "Nanook of the North." . . .

Later he collaborated with the German director, the late F. W. Murnau, on "Tabu," a Tahitan idyll, and then he went to Britain, where with John Brierson he made a study of British craftsmen titled "Industrial Britain." Later he journeyed to Inishmore, in the Aran Islands off the Irish coast, where he used the natives to make "Man of Aran," termed by Jean-Benoit Levy in his book, "The Art of the Motion Picture," the best example of Mr. Flaherty's art.

Between 1935 and 1937 he photographed a dramatization of Kipling's "Jungle Book" in Mysore, India, and in United Artists' London studio. The film was released as "Elephant Boy" with his discovery, Sabu, in the title role. Two years later he turned to America with "The Land," a feature on soil erosion and agricultural displacement, which he turned out for the Department of Agriculture.

Having obtained financing from the Standard Oil Company in 1946, Mr. Flaherty began work on "The Louisiana Story," in an effort that was to take fifteen months and a budget of $258,000. The film was hailed extensively.

How To Build The Home Movie Story

"Thanksgiving"

HARRIS B. TUTTLE, FPSA

MOVIES MADE of the family during the year are usually looked upon as casual family record pictures. However, when the family gets together for Thanksgiving or any other national holiday, there is always an opportunity for unusual subject material for a home movie record.

Sometimes we take our holiday celebrations for granted and cannot see at the time the future value of such films in the family record. I felt much this way about the situation until I went through some of my early movies and saw again pictures of my own children and family filmed twenty to twenty-five years ago.

Here was a record of the past—scenes that had faded from my memory—details completely forgotten by me, but not to the movie films. But suddenly they all came to life again on the movie screen.

Then I got to thinking of the days of my boyhood, back on the farm. Things seemed common place then—and hardly worth recording—but wouldn't it have been wonderful to have had a movie camera in those days and made a movie record of my grandfather selecting one of his choice turkeys to go to the chopping block. Or even before this, scenes of grandma feeding the turkeys carefully for months in advance so that they would be fat and plump for Thanksgiving. I well remembered the fruit cake, pumpkin pie and plum pudding with flaming brandy sauce that were extra specialties at holiday time.

Yes, you might say, we have pumpkin pies and plum pudding today, what's so different about it—very true. But things were much different then, mother dried her own currants—boiled her pumpkin and colandered it—

I wish I had movies of Grandma baking one of her delicious mincemeat pies.

Cut this picture out and place it in your titler for your main title of this year's Thanksgiving Movie.

cream was separated from the milk in a dozen flat tin pans in the milk shed—we would go out and hunt eggs and come in with a granite basin of eggs of all sizes and colors but all fresh, and we even churned all our own butter.

What a movie that would have made just recording all of the things that went into preparing a Thanksgiving Dinner. What a real factual historical document that would be today of life as it was lived forty to fifty years ago.

Let us now consider our present mode of life and our type of economy. Won't what we are doing today be just as interesting to our grandchildren as what our grandparents did is of interest to us? Yes, I believe you will agree with that, even though we use pumpkin and plum pudding out of tin cans, and turkeys come ready to pop into the oven. It is a way of life and it can be documented factually so that our grandchildren will be able to see and perhaps get a laugh over the crude inefficient ways we do things today, just as we might laugh at the apparently inefficient ways of our forefathers.

Yes, there is something to record in Thanksgiving this year. Something different than it was forty or fifty years ago and just as important and different from what it will be forty or fifty years from now.

We do not need to assemble properties for this picture, we do not need extensive planning in advance. All we need to do is decide where we want to start and where we want to finish. All of the factual details will develop in a casual natural way because we film a scene from life as it is being lived today.

It can start and end anywhere you choose, depending upon how much time and film can be used for the story, and how far you want to go in the undertaking.

It can start with a suitable title announcing that it is the Thanksgiving Season. A poster of a turkey for a background is sufficient. Numerals indicating the year can be cut from a calendar and pasted over the turkey. The title would read "Thanksgiving 1951" or "Thanksgiving Day at Jones' 1951." Or you can make your title from our illustration at the head of this article.

The first scene can be of a flock of turkeys on a turkey farm—one of those miscellaneous scenes filmed during your vacation last summer, that you didn't know what to do with. Now if you have an f/1.4 or f/1.9 lens or bar lights, the next scene can be of dressed turkeys hanging in the market, then a shot of mother pointing to the one of her choice. The scenes can progress in logical sequence—the butcher places the bird on the scales, then a close-up showing the weight, then wrapping up the bird. (I find butchers are cooperative in helping to get scenes like these.) Here is a chance for an excellent record shot—make a close-up of the amount rung up on the cash register. Forty or fifty years from now it will be interesting to see the price of a 14-pound turkey in 1951.

The next scene shifts to mother stuffing the bird with dressing and placing it in the oven.

Then a title, "In the meantime," now for shots of making apple or pumpkin pie—shots of cooked cranberries being poured into a salad mold.

Pictures of the family and guests as they arrive for dinner. Shots of the turkey as it is withdrawn from the oven for basting or turning—make these shots in color of that golden brown turkey—as a matter of fact, shouldn't every shot of this Thanksgiving film be made in color? Close-ups of cutting pumpkin pie—cranberries—these are all colorful details for color film. Then the big moment arrives when everyone is seated around the table—a close-up of father carving the turkey—a shot of one frame per second of everyone passing food around the table—this will produce a laugh when it is shown later. Close-up of the pumpkin pie or plum pudding—then finally the scenes of all the family dozing off for a nap while mother and grandma perform the "clean-up" task in the kitchen. Make a shot of grandpa sound asleep with his vest open to provide breathing space, and end with a shot of the dog or cat stretched out sound asleep in front of the fireplace.

Whatever the customs of your family are in celebrating this holiday, they can be made into an interesting documentary film. The normal routine followed by them will become your story outline—but be sure and get some of the details in close-ups. Close-ups are the life-blood of home movies.

Be sure and film in color that scene when father first slices into the golden brown turkey.

Historical Developments in Underwater Photography

HENRY S. MONCRIEF *

THERE ARE twice-told tales on self-processing and high speed cameras, motion pictures and television cameras, aerial photography, and other outlets for the photographers, but nary a by-line on underwater photography. Admittedly, there are comparatively few participating in this fascinating form of photography, but the numbers are on the increase. There are very few companies producing underwater cameras, but those interested are making and selling more than ever before.

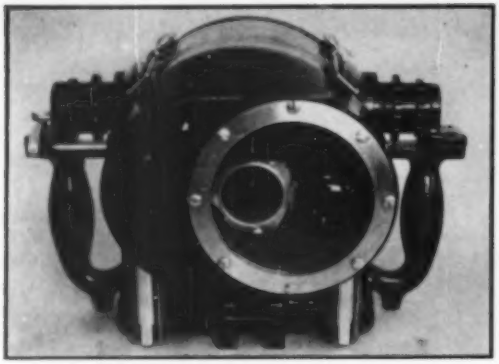
The year 1893 marks the birth of underwater photography. In that year Dr. L. Boutan, a French biologist, enclosed a fixed-focus camera in a monstrous water-tight copper box and took some recognizable pictures of still objects. Seven years later he secured some successful underwater night pictures by using arc lamps enclosed in water-tight jackets. The original setup for this underwater light was quite unique. It consisted of blowing magnesium powder over an alcohol lamp burning in a submerged bell jar.

After Dr. Boutan's excellent start, underwater photography fell into the doldrums. It remained there for some 17 years until a man, who is recognized as the father of underwater photography in the U.S.A., produced some usable underwater pictures. Due to his successful efforts others were encouraged to experiment and further develop this art. We refer to Dr. W. H. Longley, most of whose experiments were conducted at the Carnegie Institution Station in Dry Tortugas. In 1917 he secured some satisfactory underwater still pictures with a 4 x 5 Autograflex camera enclosed in a heavy brass box. The focus, speed and trigger were available to the diver. Lens fogging was one of his greatest difficulties and weight also was a problem. He had to rest the camera on his knees while focusing.

Dr. Longley continued his experiments and in 1923 he obtained the first color pictures, Autochromes, taken with very long exposures. Of necessity his subjects had to be still life. By 1926 he was able to obtain color photos of fish by a unique and highly dangerous process: It consisted of igniting a pound of magnesium powder on the surface of the water with a reflector over the top, synchronized with the camera. This setup was confined to shallow water—10 ft. to 15 ft. and moderately successful pictures were taken at 1/20 sec.

In 1927 after several experimental years, Dr. Paul Bartsch, of the Smithsonian Institution, designed a successful underwater motion picture camera. We cannot locate any authoritative information on the first motion picture camera. Possibly this was it; at any rate, it was

* Manager, Fenjohn Underwater Photo & Equipment Company, 90 Cricket Ave., Ardmore, Penna.



Front view of a modern 16mm underwater motion picture camera.

the first motion picture camera that could be focused under water.

Around this same time Arthur C. Pillsbury, scientist, inventor and lecturer, constructed both an underwater still and motion picture camera. Successful underwater pictures to illustrate his lectures were taken. His motion picture cameras continued in the heavy class; it weighed 170 lbs.

The American Museum of Natural History of New York City conducted an expedition to Haiti in 1928 to study fish and their habits. An underwater motion picture camera compartment was constructed by the Museum under the direction of Messrs. Wm. Beebe, Mark Barr and John Tee-Van. A DeVry motion picture camera was chosen, chiefly because it was almost rectangular, and it proved very efficient for their purpose. The camera was enclosed in a brass box. The front contained a glass port; the rear opened to allow the insertion of the camera. This was then clamped closed by ten screw clamps. It was water-tight, having no openings of any kind, even the trigger, the only underwater control, being operated by pressing a rubber Torsion disk. It was necessary for the diver to descend, select his location, obtain his light measurements, distance, etc., return to the surface, have the camera adjusted, descend, run off his footage until the absence of vibration told him the spring was run down, send his camera to the surface for winding, then continue his picture. In spite of these handicaps some satisfactory footage was obtained.

E. R. Fenimore Johnson became interested in underwater photography in 1928 and designed a cylindrical water-tight housing for his motion picture camera. Only the trigger was available to the diver. Very little usable footage was taken with this first one, but it paid off in experience. Development was continued by Mr. Johnson under the name of the Mechanical Improvements Corporation (later changed to Fenjohn).

By 1931 a Bell & Howell Eyemo was enclosed in an aluminum cast housing which took on the appearance of a modern underwater motion picture camera. This was the first commercial underwater motion picture camera. One of these was sold to the Vanderbilt-Gilks Oceanographic Expedition of 1931. It took successful underwater motion pictures, some of the footage being included in the commercial motion picture production by Vanderbilt, called "Devil's Playground."

The Johnson-Smithsonian deep sea camera housing was next constructed. Two features were ingenious and interesting: The optically flat quartz window that lay on a lapped steel surface—no gaskets were used, a perfect, non-leaking fit was accomplished; and the soft copper gasket which flowed under pressure when the housing was closed. On 27 February 1933 it was proven watertight when lowered to a depth of 3000 fathoms. Unfortunately, on the next lowering, the suspending wire parted and the camera was lost.

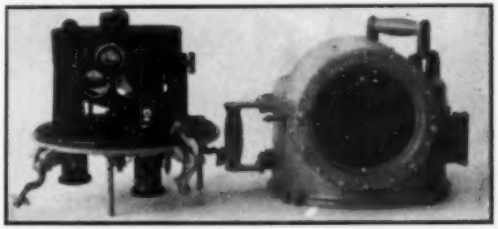
A method of determining the volume of underwater light was found to be necessary. As a result an underwater exposure meter was produced in 1933 by enclosing a Weston meter in a water-tight case.

In 1936 Mechanical Improvements Corporation produced an underwater motion picture camera with an Akeley mechanism which embodied more "firsts" than any other underwater camera. It included a rotatable polarizing plate, interchangeable filters, and a choice of three lenses, all within the housing and operatable by the diver. It was also the first electric power-driven underwater camera. Next year an underwater still camera was produced with a Leica mechanism which had many of the Akeley features plus a coupled range finder.

The year 1935 introduced a very colorful personality in the person of Captain John D. Craig. He constructed an underwater motion picture camera using a DeVry "A" newsreel camera. He took much excellent hair-raising adventure type of footage which had a ready sale to various motion picture companies.

Drs. E. Newton Harvey and Edward R. Baylor became interested in underwater photography through a desire to obtain photographs of deep sea luminous fish. In 1939 Dr. Harvey designed a pressure chamber to withstand a two mile depth. There were two windows, one for a 16mm motion picture camera and one for a light. Some small organisms were recorded by this camera at 500 and 700 fathoms.

Woods Hole Oceanographic Institution jumped into the underwater limelight in 1941 with Dr. W. Maurice Ewing's cameras. His most successful design was a German Robot still camera in a water-tight case on a pole some twelve feet long. Flashlights attached to the



The first commercial camera—Johnson's camera with Bell & Howell mechanism.

pole are set off upon contact with the bottom. The camera rig is not joined with the boat in any way but returns to the surface after taking the pictures upon automatically dropping her ballast. Very successful pictures of limited areas have been taken down to 2700 fathoms. The photographs taken with this camera have received more publicity than any other underwater series, probably because of their uniqueness together with very good reproduction.

Around the latter part of 1948 Wm. F. Dudley Whitman, of Miami Beach, Florida, designed an unusual underwater motion picture camera housed in lucite. Successful underwater pictures taken with this camera were published in *"Life"* magazine.

This thumbnail history brings us up to the present. At this time Fenjohn is the only company manufacturing underwater cameras in quantities, the business previously having been on a custom basis with custom prices of $5,000.00 to $15,000.00. By small quantity production, prices have been brought down to $1,900.00 with every adjustment available to the diver. The weight of the present Fenjohn camera, including self-contained batteries, is 21 lbs. in air and 3¾ lbs. under water. It can be reloaded in thirty seconds due to quick acting clamps and magazine film.

"FIRSTS" IN UNDERWATER PHOTOGRAPHY

1893—Successful underwater camera.	Dr. L. Boutan
1900—Successful underwater photographs taken by artificial light.	Dr. L. Boutan
1917—Focus and speed adjustments available to diver (still camera).	Dr. W. H. Longley
1923—Autochrome (color) still pictures.	Dr. W. H. Longley
1926—Autochrome (color) action (fish) pictures.	Dr. W. H. Longley
1927—Focus by diver (motion picture camera).	Dr. Paul Bartsch
1931—Commercial motion picture camera, and aperture and wind available to diver.	E. R. Fenimore Johnson
1933—Deep sea camera—descended 3000 fathoms.	E. R. Fenimore Johnson
1933—Underwater exposure meter constructed.	E. R. Fenimore Johnson
1935—To photograph adventure—commercial use.	Capt. John D. Craig
1936—Filters, lens, polarizing plate, electric drive (motion picture camera).	E. R. Fenimore Johnson
1937—Focus coupled with range finder (still camera).	E. R. Fenimore Johnson
1939—Pictures taken at 700 fathoms depth.	Drs. E. Newton Harvey and Edward R. Baylor
1941—Pictures taken at 2700 fathoms depth.	Dr. W. Maurice Ewing
1948—Camera housing constructed of plastic (motion picture camera).	Wm. F. Dudley Whitman
1950—Bantam weight motion picture camera (21 lb. in air).	E. R. Fenimore Johnson

Diver using Johnson's camera with Akeley mechanism.

There have been many unsuccessful attempts at underwater photography, such as the 1700 lb. camera that rotated 360° and took pictures at various focal lengths; the camera which was lowered and sighted through a periscope; or the many amateur creations in basketball bladders, etc. These are briefly mentioned to correct any impression that the development was a simple and easy one and without its disappointments. There is much more to underwater photography than enclosing a camera in a water-tight case. As with any type of creative work, there were months and years of patient work, sweat and disappointments before a successful and efficient underwater camera was developed.

Calibrate Your Exposure-Projection System

HARRIS B. TUTTLE, FPSA *

PERSONS who make motion pictures or color slide transparencies frequently obtain results which appear to vary from light to dark in projection. The pictures made by one person may always appear too light, while the pictures made by another may appear too dark.

The still photographer, who makes prints from properly exposed negatives to be viewed by reflected light, knows when his print is too dark that he has either overtimed the exposure in making the print or perhaps left it in the developer for too long a time.

When a movie maker or color slide worker projects his pictures on a projection screen, they may appear either too light or too dark, and he may attribute this to over- or underexposure when actually the cause of his difficulty is improper projection screen brightness.

Projector manufacturers have tried to design their equipment so that it would be useful in the school or church auditorium as well as in the home. To accomplish this, they have made their projectors so that lamps of different wattage can be used to satisfy the needs in the home, where a relatively small picture is adequate for a small audience, and the requirements of an auditorium where a large picture is necessary for a large audience.

Manufacturers have also supplied projection lenses of varying focal lengths so that the projectors can be placed at practically any desired distance from the screen and yet maintain a picture of proper size.

It has always been my contention that it is just as important to adjust the brightness of the projection screen as it is to measure the light falling on the subject in exposing the picture. In other words, once one obtains a correct exposure in the camera, it is important that the picture be projected to recommended size and illuminated with the proper amount of light for the particular type of screen being used.

In order to accomplish this, it would be necessary to use an exposure meter so adjusted that it will provide a reading or index to screen brightness, or follow closely the tables recommended by manufacturers wherein a certain screen size and type is recommended for each combination of lens f/value and lamp wattage.

After observing the projection habits of a large number of amateurs during the past few years, I believe I can safely say that quite a number are projecting their movies or stills with either too much or too little light for the size and type of screen used.

This may seem like an exaggerated claim, yet, it is amazing to see many people project their 16mm movies to a small 22 x 30 screen and use an f/1.6 projection lens and either a 750- or 1,000-watt lamp. On the other hand, persons with an f/2.5 projection lens and a 400-watt lamp often try to project their 8mm films to a 39 x 52 screen size.

There are certain limits to the performance of projection equipment just as there are limits to any other mechanical devices. We have a speedometer on our automobile that registers from zero to 120 miles per hour—yet, how many have ever driven at 120 miles per hour? We find that the car gives the best performance and best mileage when we drive at an intermediate speed of from 30 to 50 miles per hour.

The same reasoning applies to photography. We don't make all our pictures with the lens wide open or with it stopped down to the smallest opening. Perhaps 95% of all pictures are made at intermediate lens openings with movie cameras and at intermediate shutter speeds with still picture cameras: 1/25 or 1/50 or 1/100 at f/5.6, f/8, or f/11. The f/1.9 or f/1.4 and the f/16 and f/22 lens openings are for unusual situations when extra controls are required.

The same is true of projector usage. As stated earlier, manufacturers design their equipment to have great range so that it can be used under many conditions. However, perhaps 90 or 95% of movies and stills could be projected with lamps, lenses, and screens that represent an intermediate value. Just because the manufacturer makes his projector so that it will accommodate an f/1.6 lens and a 1,000-watt lamp doesn't mean that everyone should select these items of equipment for a moderate sized picture in the home. There is a definite place to use this combination of lamp and lens speed.

The focal length and aperture of lenses and the lamps available for projectors might be defined as tools. There is a tool or combination of tools best suited for each set of projection requirements. The only thing the amateur has to do is determine his standard requirements and select a lens speed and focal length and lamp wattage capable of delivering a picture of the proper size and one of the required brightness.

Once projection conditions are standardized, it is an easy matter to adjust exposure in the camera so that it will produce movies or stills of the right density for projection under the standardized projection conditions.

Since color films are used extensively for both movies and slides, let's consider the characteristics of color film for a moment. While color film has somewhat less latitude than black-and-white materials, it does, nevertheless, have sufficient latitude to record and properly render a large percentage of what can be classified as normal, average subjects.

Color films will record a brightness scale of about 1–200. Average brightness scale of exterior scenes is

* Eastman Kodak Company, Rochester, N. Y.

1–160. Contrasty scenes may have brightness scale values as high as 1,000 or more. Extremely low contrast scenes may have brightness scale values of about 1–10. Therefore, the average subject brightness scale will be recorded on most color films.

There are, of course, many outdoor subjects where bright sky and deep shadows combine to produce a brightness scale greater than 160. Sunsets and side and back lighted subjects are of this type.

In lighting subjects indoors with Photoflood light, the light contrast can usually be held at a low level, 1 to 2, to 1 to 5, merely by balancing the illumination on the subject. The subject, however, may have a brightness scale of 1–40 to 1–100.

In any event, the exposure recommended by exposure guides, exposure tables, and exposure meters is based upon exhaustive tests made under carefully controlled conditions. Exposure recommendations are adjusted for varying conditions of lighting and differences in subject contrast, so that if the correct exposure is given in the camera, each scene of the processed film will have the proper highlight and shadow density for good projection. In simple words, if the color film is properly exposed it will have the correct highlight and shadow density for good projection.

If color pictures are correctly exposed, all that is necessary to see them properly on the projection screen is to adjust the screen brightness so that the projected picture will appear to resemble the original subject at the time it was filmed.

If a picture made in bright full summer sunshine appears dark on the screen, as though it was made on a dull overcast day, then something is wrong—either with exposure in the camera or with the projection system.

A perfectly projected picture has been described as one which, when viewed in a darkened room, gave the observer the feeling that he was looking out of an open window at the actual scene and not at a picture of it. This may not be the best definition possible but it certainly does represent an idealism everyone should try to attain.

A properly exposed picture, either movie or still, should show shadow details and not appear to be "plugged up" or too black in the shadow areas. Such areas should have transparency in them. See Fig. IB.

The highlights or lightest areas like white shirts or similar objects should also show detail such as creases in the shirt material which cause faint shadows.

When a black or shadow area does not show transparency and shadow detail, it is probably underexposed or too large a picture is being projected, or a lamp of too low wattage is being used. See Fig. IA.

When a white or highlight area does not show highlight detail on the screen and the detail appears to be washed

Fig. IB. If your pictures appear like this on the screen, your camera exposure and screen brightness are both in balance.

Fig. IA. If your pictures appear like this, one of three things can be wrong. Film was underexposed in the camera; or film is projected to too large a size for lens aperture and lamp wattage; or a lamp of too low a wattage and a lens of too small an "f/value" are being used.

Fig. IC. If your pictures appear like this, one of three things can be wrong; film was overexposed in the camera; or film is projected to too small a size for lens aperture and lamp wattage used; or a lamp of too high wattage and a lens of too large an "f/value" are being used.

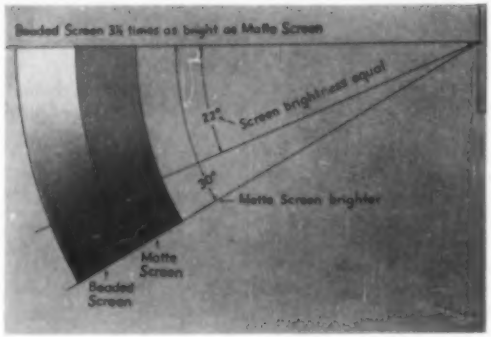


Fig. II. Relative Reflectivity of Matte and Beaded Projection Screen Surfaces.

out, then the picture is either overexposed or it is projected to too small a size, or a lamp of too high wattage is being used. See Fig. IC.

Frequently, it is possible to appraise the film for overexposure by placing the film in contact with a piece of white paper, and then viewing the picture by reflected light. If the paper shows through the highlight area and no fine detail is discernible, then it's a pretty good indication that the film is overexposed. Under such circumstances the light middle tones also appear to be too light or washed out. Underexposures cannot be checked as easily by this method, except that in most cases of underexposure the highlights as well as the shadows appear to be too dark.

When the illuminated screen appears darker than a clean piece of white typewriter paper held in contact with the screen, the screen should be either cleaned, resurfaced, or replaced because it is obviously soiled with age and is not efficiently reflecting the light that falls on it.

The selection of the proper type of screen surface for your needs is also an important consideration. There is a considerable difference in lamp wattage and screen size recommended for the two types of screens, the matte white surface and the beaded surface which are commonly used today.

When rays of light from a projection lamp fall on an opaque, matte-white surface like the matte screen, they are reflected back and are scattered in all directions. If the surface is flat white, like chalk or a bed sheet, the reflected light is scattered almost equally at all angles. See Fig. II. A picture projected on a screen of this type appears almost as bright when viewed from way off to one side as it does when viewed straight on from a point near the projection axis at the projector. However, a picture viewed from far off to the side appears unnatural, because objects appear distorted (too tall and too thin).

If the screen surface is semi-specular or has some special surface, such as the beaded type of screen, it appears brighter on the projection axis than does a flat-white type of screen because the same total quantity of light is scattered over a narrower angle or almost straight back from the screen. A picture projected on this type of screen appears less bright way off to the side than one projected on the flat-white type of screen. See Fig. II.

It can now be seen that each type of screen surface has certain advantages. Matte screens are best suited for projection across the narrow dimension of the room or under circumstances where the audience is spread out over a wide angle. It can also be seen that for a given size of picture more light is needed for the matte surface screen than is required for the beaded surface screen. Beaded screens are best suited to average rooms where the picture is projected the length of the room.

With a lamp of given wattage it means that a slightly smaller picture must be shown on a matte surface screen than can be shown on a beaded screen in order to obtain equal screen brightness.

Once a screen surface and screen size have been selected to conform with projection equipment, it is advisable to arrange the seating layout so that each one in the audience will have a satisfactory view of the screen.

Since the most desirable viewpoint for each type of screen is near the projection axis, a wasteful center aisle should be avoided whenever possible.

With matte-surface screens, the front row of seats should be located at a distance of at least two screen widths, and with beaded screens, at a distance of at least 2½ screen widths away from the screen. The number of front row seats in width should not exceed the distance in feet from the screen for matte-surface screens, and 75% of this distance for beaded screens.

The maximum distance for effective viewing of a screen is about 6 times the horizontal screen width. Persons having extremely good eyesight may be able to see quite satisfactorily up to 8 screen widths away.

The foregoing data make it possible to lay out a diagram or seating arrangement best suited to each screen size and screen surface. See Fig III-A and Fig. III-B. If the audience can be confined to the area indicated, each person will be able to view the screen to the best advantage.

Since a projected picture appears distorted when viewed at an angle greater than 30° to the projection axis, care

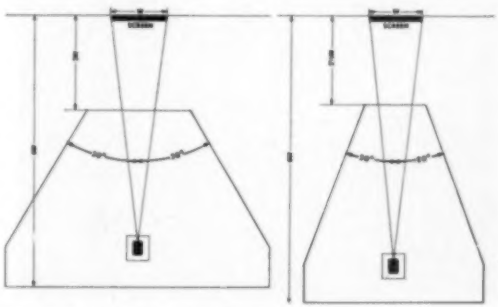


Fig. III—A & B. The audience viewing projected movies or stills should be seated to conform with the type of screen used. Audience can be spread over a wider area for matte surface screens, "A" (Left), than for beaded screens, "B" (Right).

should be exercised to see that no seats are placed outside this 60° arc.

The best results will be obtained when pictures, particularly color pictures, are projected in a darkened room. Any extraneous light from windows or doors should be subdued or eliminated whenever possible.

While it is permissible to have a weak, low-wattage lamp burning in the room where pictures are projected, such illumination should not exceed 1/10 of a footcandle and no direct rays of light should be permitted to fall on the screen.

For the benefit of the more serious minded who want the A.S.A. recommended screen brightness figures, here they are:

For matte surface screen:

5 footlamberts—minimum

10 footlamberts—recommended A.S.A. standard

20 footlamberts—maximum

For beaded screen:

10 footlamberts recommended

Not more than 20 footlamberts at 5° or less than 5 footlamberts at 20°.

Footlamberts are obtained by multiplying footcandles by a reflectance factor:

Illumination in footcandles = E

Reflectance factor = R

Brightness in footlamberts = B

Thus, $E \times R = B$

Example: with 15 footcandles on screen, 0.78 * reflectance factor for matte screen—$15 \times 0.78 = 11.7$ footlamberts or close to the value of 10 footlamberts recommended.

Now, let's see what might be happening in your case. If you are using an exposure meter to determine exposures, it's possible the exposure index or calibration on your meter may be off just a hair so that you are not hitting the bull's-eye and getting your exposure on the center area of the film scale.

Meters do help one to obtain uniform results but the results can be uniformly slightly overexposed, or uniformly slightly underexposed, as well as uniformly correct. That's why it's a good idea for each one using a meter to check it, and if it is off, calibrate it to match his own camera and working conditions.

Now, let's try to tie this exposure and projection screen information together with the information on projectors. If a correctly exposed picture is projected on too small a screen, even though an intermediate lamp and lens are used, the picture will appear too light on the screen. Furthermore, if the correctly exposed film is projected to an intermediate screen size—but if an f/1.6 projection lens and a 750- or 1,000-watt lamp is used, the picture will also appear too light on the screen or overexposed. See Fig. IC.

There are a number of known cases where persons have cut down on their exposure by one or more stops so that they were on the verge of underexposure just so their pictures would appear to have proper screen brightness when projected with a high-wattage lamp and a large aperture lens.

On the other hand a great many 8mm film users have purposely overexposed by one-half to one stop. This produced light thin positives which could be projected to a slightly larger screen size. In either case the user is sacrificing good photographic quality to favor his projection conditions.

The average movie maker or color slide maker does 95% or more of his projecting in his own home, and only occasionally to movie club or color club groups. In either case, the audience may number anywhere from three to four in the home, to 25 or 30 at the club. Therefore the average middle-of-the-road projector accessory tools will meet these requirements. In purchasing lenses, lamps, and screens, the average user can follow these tables with good results. See Fig. IV A, B, C.

The values recommended in these tables are based on the screen lumens supplied by typical projection equipment. The values are also for uncoated projection optics. With coated optics a slightly brighter picture will result or a slightly larger projection screen size can be used (approximately 12% wider screen). They are also for use in reasonably well darkened rooms where there is not more than 1/10 of a footcandle of extraneous light falling on the screen.

It's always a temptation for owners of 8mm projection equipment to try and project their pictures to the same size as persons using 16mm equipment. With lenses of equal aperture and lamps of equal wattage, the 8mm picture should actually be shown on only one-half the

TABLE OF RECOMMENDED SCREEN SIZES, ETC.

Film Size	*Screen or Picture Size*	*Type of Screen*	*Lamp Wattage*	*Lens Aperture*	*Long focus or other f/2.5 Lenses*
16mm	*30″ x 40″	Matte white	400W	f/1.6	750W
16mm	*30″ x 40″	Beaded	300W	f/1.6	
16mm	†39″ x 52″	Matte white	750W	f/1.6	1000W
16mm	†39″ x 52″	Beaded	500W	f/1.6	750W
16mm	‡54″ x 72″	Matte white	1000W	f/1.6	
16mm	‡54″ x 72″	Beaded	750W	f/1.6	
8mm	*22″ x 30″	Matte white	500W	f/1.6	
8mm	*22″ x 30″	Beaded	300W	f/1.6	750W
8mm	†30″ x 40″	Matte white	750W	f/1.6	
8mm	†30″ x 40″	Beaded	500W	f/1.6	
8mm	‡37″ x 50″	Matte white	——		
8mm	‡37″ x 50″	Beaded	1000W	f/1.6	
					f/3.5 or f/3.7
35mm	*50″ x 50″	Matte white	100W	f/2.3	150W
or	*50″ x 50″	Beaded	100W	f/2.3	100W
Bantam	†70″ x 70″	Matte white	200W	f/2.3	300W
2 x 2	†70″ x 70″	Beaded	150W	f/2.3	200W
Slides	‡ 8′ x 8′	Matte white	400W	f/2.3	500W
	‡ 8′ x 8′	Beaded	200W	f/2.3	200W
	‡12′ x 12′	Matte white	750W	f/2.3	1000W
	‡12′ x 12′	Beaded	400W	f/2.3	500W

* Recommended for use in average home

† Recommended for use in churches, movie or camera clubs

‡ Recommended for use in medium sized auditoriums

* A perfect diffuser and perfect reflector would have a factor of 1.0 and will diffuse or scatter light equally in all directions. The matte surface screen is 0.78 efficient in this respect.

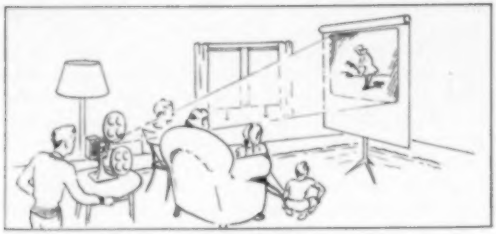


FIG. IV-A. SMALL GROUPS

Screen	*Maximum Size of Audience*	*Lamp Wattage Required at f/1.6*	*Lamp Wattage Required at f/2.0*	*Lamp Wattage Required at f/2.5*
16mm				
30 x 40 Matte	35	400W	400W	750W
30 x 40 Beaded	20	300W	300W	300W
37 x 50 Matte	50	500W	750W	1000W
37 x 50 Beaded	30	300W	300W	400W
8mm				
22 x 30 Matte	20	500W	750W	
22 x 30 Beaded	10	300W	300W	
30 x 40 Matte	—	——	——	
30 x 40 Beaded	20	500W	750W	
2 x 2Slides				
			f/3.5 or f/3.7	
		f/2.3		
50 x 50 Matte	50	100W	150W	
50 x 50 Beaded	30	100W	100W	

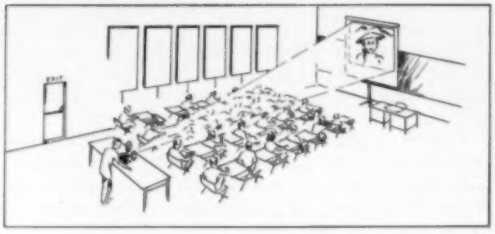


FIG. IV-B. SCHOOL & CLUBS MEDIUM GROUPS

Screen	*Maximum Size of Audience*	*Lamp Wattage Required at f/1.6*	*Lamp Wattage Required at f/2.0*	*Lamp Wattage Required at f/2.5*
16mm				
45 x 60 Matte	75	750W	1000W	——
45 x 60 Beaded	45	400W	500W	750W
52 x 70 Matte	100	1000W	——	——
52 x 70 Beaded	60	500W	750W	1000W
8mm				
30 x 40 Matte	—	——	——	
30 x 40 Beaded	20	500W	750W	
37 x 50 Matte	—	——	——	
37 x 50 Beaded	30	1000W	——	
2 x 2 Slides				
			f/3.5 or f/3.7	
		f/2.3		
60 x 60 Matte	75	150W	200W	
60 x 60 Beaded	45	100W	100W	
70 x 70 Matte	100	200W	300W	
70 x 70 Beaded	60	150W	200W	

screen width used for 16mm films. It's as unwise to try to exceed this width as it is for 16mm owners to try and project their pictures as large as the 35mm film projected on a theater screen.

The standard 35mm motion picture film shown in the theatres has a picture size approximately 1 inch x ¾ of an inch. This picture is enlarged on the theatre screen, which is approximately 16 x 20 feet in size. To project such a picture, a high intensity 150-amp. arc lamp is used. The small frame of 35mm film is actually enlarged about 240 times on the 16 x 20 foot screen.

In the case of 16mm film, the picture size is about 1cm x ¾cm, and since the 1,000-watt lamp is the largest that can be used efficiently in home projectors, a picture only 54 x 72 inches can be obtained using an f/1.6 projection lens on a matte screen. This represents a magnification of the picture on the screen of 182 times. There are 16mm arc projectors which will provide sufficient illumination for showing 16mm films up to 12 x 16 feet or 16 x 20 feet.

In the case of 8mm film the picture is 5mm x 3.25mm or about one-half the width and height of the 16mm film. Therefore, in projecting the 8mm film and using a 1,000-watt lamp and an f/1.6 lens, it should be projected to a 27 x 36 inch size picture only or half the width recommended for the 16mm film. This would also represent a magnification of 182 times. See Fig. V.

When an 8mm owner tries to enlarge his films to 54 x 72 inches, he is trying to enlarge to a screen size 50% larger than 35mm films are normally enlarged in the theatres.

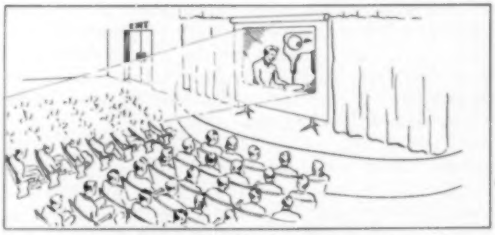


FIG. IV-C. AUDITORIUM LARGE GROUPS

Screen	*Maximum Size of Audience*	*Lamp Wattage Required at f/1.6*	*Lamp Wattage Required at f/2.0*	*Lamp Wattage Required at f/2.5*
16mm				
63 x 84 Matte	—	——	——	——
63 x 84 Beaded	90	750W	1000W	——
6 x 8 feet Matte	—	——	——	——
6 x 8 feet Beaded	120	1000W	——	——

8mm

Not recommended for auditorium use, but in emergency, try 1000-watt lamp, f/1.6 lens using a 37 x 50-inch Beaded Screen.

2 x 2 Slides

			f/3.5 or f/3.7
		f/2.3	
8 x 8 feet Matte	200	400W	500W
8 x 8 feet Beaded	120	200W	200W
9 x 9 feet Matte	250	500W	500W
9 x 9 feet Beaded	150	200W	300W
12 x 12 feet Matte	440	750W	1000W
12 x 12 feet Beaded	260	400W	500W

From this data, it becomes easy to understand the reasons for calibrating projection equipment to camera exposures in order to obtain the optimum picture quality on the screen.

I strongly suspect that many of the persons who disagree with the standard exposure instructions packed with the film, do so because their projection equipment (lens, lamp and screen) are not balanced for a picture of average density obtained by correct exposure.

The use of a lamp of too high or too low a wattage or a screen of the wrong size and type can make camera exposures appear to be anywhere from one to two stops off.

All the average person needs to do to obtain good projection results is to follow the recommended table of screen sizes for each combination of lens f/value and lamp wattage. Such tables are found in the instruction books supplied with both motion picture and still picture projectors.

FIG. V. TABLE OF MAGNIFICATION

	35mm	*16mm*	*8mm*
Screen Size	16 x 20 feet	52 x 70 in.	26 x 35 in.
Screen Brightness	12 ft. lamberts	10 ft. lamberts	10 ft. lamberts
Screen Type	Matte surface	Matte surface	Matte surface
Picture Size	1" x ¾"	1cm x ¾cm	5mm x 3.25mm
Light Source	150 amp. arc	1000W lamp	1000W lamp
Lens Aperture	f/2 to f/2.5	f/1.6	f/1.6
Picture with Magnification	240X	180X	180X

However, the person who may want to be precise about screen brightness can calibrate his exposure meter to give an index of screen brightness. The technique for this is covered in an article on the following pages by Allen Stimson.

Measurement of Projection Screen Illumination and Brightness with Exposure Meters

ALLEN STIMSON, APSA *

A typical scene used in the study of screen brightness for 35mm color slides.

THE IMPORTANCE of having adequate projection screen brightness has been discussed by Harris Tuttle in the preceding article entitled "Calibrate Your Exposure-Projection System." The measurement of the light on the screen is usually a rather simple procedure and can be done with most exposure meters. When the desired value has been determined, the projection system can be adjusted accordingly by moving the projector closer or farther away from the screen, by using a different wattage projection lamp, or by placing a smaller aperture over the projection lens.

THE EXPOSURE METER

Exposure meters of the photoelectric type are either reflected-light (brightness) meters, or incident-light (illumination) meters. The reflected-light meter can be distinguished by its directional means. This is usually a hood, a lens system, or a combination of the two.

An incident-light meter accepts light from an included angle of about 180 degrees. It may have either an exposed cell with no directional restriction around it, or the cell may be covered with a translucent, plastic, diffusing collector.

PHOTOMETRIC UNITS

The difference between the words "illumination" and "brightness" can be easily understood in terms of the projection system. The illumination at the projection screen is the intensity of light projected on it. This illumination depends upon the projector and is independent of the characteristics of the screen. The illumination at the screen from a given projector will vary as the square of the distance from screen to projector.

The brightness of the screen is the product of the screen illumination multiplied by the reflectance value of the screen. The brightness of the screen is independent of the distance from which the screen is viewed. It does, however, depend upon the direction from which the screen is observed because screens have different reflectance values at different angles of incidence or viewing. This is particularly true of the glass-beaded screen.

A unit of illumination is the footcandle, which is equal

* General Electric Company, Meter & Instrument Department, West Lynn, Massachusetts.

TABLE I. PHOTOMETRIC UNITS

Quantity	Unit	Equivalent Value
Illumination * (Illuminance)	Footcandle	1 incident lumen per square foot
Brightness * (luminance)	Footlambert or Candle per square foot	1 Reflected † Lumen per square foot 3.1416 reflected † lumens per square foot

* The term illumination and illuminance may be used interchangeably to describe the quantity. Likewise, the terms brightness and luminance may also be used interchangeably. The former terms are preferred by the Illuminating Engineering Society and are defined in American Standard Z7.1—1942. The latter terms are preferred by the Optical Society of America and are defined in the proposed American Standard Z58.1.1/22 of April 1951.

† Brightness is the luminous intensity in the direction of the observer. The brightness may be due to reflection of incident light or to the emission of light.

to one lumen per square foot. The unit of brightness, the footlambert, is also numerically equal to one lumen per square foot. The brightness of the screen in footlamberts is found by multiplying the illumination in footcandles on the screen by the screen reflectance. Since the screen reflectance is always less than one, the screen brightness in footlamberts will always be numerically less than the screen illumination in footcandles.

Exposure meters having scale graduations in footcandles can usually be used to measure the illumination directly in footcandles provided the directional means are removed, as described in instruction books. In Table I are shown the equivalent and conversion units for photometric quantities.

In Table II are outlined the paragraph references to the following methods of calibrating, and using the exposure meter for measuring screen illumination and brightness. If the exposure meter is not provided with calibration data in photometric units, the meter can be calibrated by the approximate methods given here. While it is not possible to obtain precise results without laboratory equipment, the assumptions and procedures suggested should give measurements of sufficient accuracy for the intended purpose. These methods of meter calibration are not intended for proving or disproving the accuracy of a meter. These methods give the user a means of measuring light in photometric units when the units are not shown on the meter scale or in the instruction book.

TABLE II. PARAGRAPH REFERENCES TO USES OF EXPOSURE METERS IN MEASURING SCREEN ILLUMINATION AND BRIGHTNESS

OPERATION	Type Meter	
	Reflected Light	Incident Light
Calibration Check:		
Illumination (footcandles)	A	A
Brightness (footlamberts)	B	F
Measurement:		
Screen Illumination	C	C
Calculation of Brightness	D	D
Screen Brightness	E	F

A. *Calibrating the Meter in Footcandles*

Any exposure meter can be calibrated approximately in footcandles for a concentrated source such as the projector. Reflected-light meters must be pointed almost exactly at the source during calibration and when making the measurements so that the directional means will not cast a shadow on the cell.

For approximate work an ordinary 100-watt tungsten lamp can be used as the reference source. If the lamp is operated at rated voltage in a socket with no shade or reflector and spaced at least 5 feet from walls, then the illumination at a definite distance from the lamp can be assigned a definite value in footcandles. In Table III is shown the distance at which the meter should be held for obtaining a scale indication for each of several values of illumination. The distance is measured from the center of the 100-watt lamp in a direction perpendicular to the axis of the lamp and measured to the plane of the cell. The meter must be pointed directly towards the source so that the directional means will not cast a shadow on part of the cell. The maximum reading is obtained when the meter axis is aligned with the source.

B. *Calibrating the Meter in Brightness Units*

Exposure meters designed to measure reflected light or brightness have directional means around the cell so that the field of view will be limited to some hypothetical solid angle. At the factory these meters are calibrated by pointing them towards a uniform source of known brightness and adjusting the instrument mechanism for the corresponding scale values. Exposure meters can be calibrated in units of candles per square foot, footlamberts, logarithmic units or arbitrary scale numerals. If the scale numerals are not expressed directly in photometric units, the corresponding brightness values may be given in the instruction book, as is done with the G-E Type PR-1 exposure meter. In this instrument the scale numerals are logarithms of the brightnesses rather than the numerical values. To obtain footlamberts with the G-E Type-DW meters having hood on and cover open, multiply the scale values by 8.

TABLE III. ILLUMINATION AT VARIOUS DISTANCES FROM 100-WATT TUNGSTEN LAMP *

Footcandles on cell	Distance from center of lamp to cell—Inches
5	54 3/4
10	40 5/16
20	29 7/16
30	24 1/8
40	21 1/8
50	19
60	17 7/16
70	16 5/16

* Lamp must be operated at rated voltage, without shade or reflector, and at least five feet from the surroundings.

It is not so easy to calibrate a brightness meter in brightness units as it is to calibrate an illumination or incident-light meter in footcandles. However, for those who wish to make a rough approximation, it can be done as follows:

Illuminate the screen with thirty or more footcandles and measure this screen illumination carefully. Read the brightness of the screen with the exposure meter by first holding the meter close to the center of the screen. Then move the meter away from the screen towards the projector or source. The reading will increase as the meter sees more and more of the illuminated screen, but will begin to decrease as soon as the field of view exceeds the size of the screen. The maximum reading is the best brightness measurement. This meter scale value corresponds to the actual screen brightness in footlamberts, which can be computed from the product of the measured illumination in footcandles multiplied by the assumed [3] screen reflectance of 70 per cent. The brightness in candles per square foot is obtained by dividing the value in footlamberts by 3.14. This method is not recommended where accuracy is desired, because of the cumulative errors from lamp voltage, uniformity of illumination of the screen, unknown reflectance of the screen, the effect of the shadow of the meter, and the difficulty in making precise measurements without laboratory equipment.

C. *Measuring Screen Illumination*

The illumination on the projection screen is measured by simply holding the exposure meter so that the light-sensitive cell is in the plane of the projection screen. The measurements are always made when the projector is running with no film in the gate. The projector is set up in front of the screen at the usual projection distance. The meter is held at the screen with the cell pointed directly towards the projector. If the projector is relatively close to the screen, and the meter is large, it is well to move the screen back so that the cell itself can be held in the position where the screen should be. This assures the distance from cell to projector being the same as that from the screen to the projector.

Most projectors throw more light on the center of the screen than on the edges or corners. It is well to check uniformity by measuring illumination on opposite sides, top and bottom, and in the four corners. The illumination at the corners should be at least 65 per cent [1] of that at the center.

D. *Calculating Screen Brightness from Illumination*

The reflectance of most clean, matte-surface screens is between 70 and 80 per cent,[2] whereas glass-beaded screens may have a higher reflectance near the optical axis, but somewhat lower reflectance at oblique angles. For the matte-surface screen, the brightness can be estimated by multiplying the illumination in footcandles by the assumed reflectance of 70 per cent.

For the glass-beaded screen, the brightness can be estimated by multiplying the screen illumination in footcandles by the assumed reflectance near the optical axis of 85 per cent.

Fig. 1. When measuring screen brightness the reflected-light exposure meter is aimed toward the center of the screen and read at the distance giving the maximum scale indication.

E. *Measuring Brightness with Reflected-Light Meters*

For meters whose calibration in brightness units is known, the brightness is measured in the same way that it is measured with incident-light meters. The aperture of the light receiver is held in contact with the center of the screen. Then the meter is moved back (Figure 1) away from the screen along the light beam axis until a maximum reading is obtained. Since most reflected-light meters do not have adequate sensitivity to measure the brightness usually available from most home projectors, the incident-light methods described above are usually preferred. However, when the sensitivity or illumination is adequate, the exposure-meter reading in brightness units should be a reliable measurement.

The brightness of a glass-beaded screen varies considerably with the angle of view. The reflected-light meter reading may show considerable variation and will always indicate somewhat less than the maximum brightness.

F. *Measuring Brightness with Incident-Light Meters*

An incident-light exposure meter can be used to measure brightness directly if the device is "cosine corrected." This means that the cell responds to oblique light in proportion to the cosine of the angle of incidence. The only exposure meter known to have this correction is the G-E Type PR-1.

The incident-light meters are usually calibrated to read true footcandles from a concentrated source, such as the projector. However, if instruments of this type are used to measure the light from an extended source, such as that reflected from a uniformly illuminated projection screen, the reading of meters having flat cells will be about 20 per cent low because the light from the edges of the screen strike the cell at an oblique angle and is reflected from its surface. However, meters having flat cells, such as the G-E DW-type, hood removed, can be used for measuring screen brightness if the reading is multiplied by 1.25.

Some incident-light meters have convex receivers over the cells which project beyond the cell by 25 to 50 per cent of the cell diameter. This type of meter is usually calibrated for measuring illumination from a concentrated source, such as the projector, but is satisfactory for measuring the brightness of an extended source only after special calibration. For an extended source, such as the screen, the reading will usually be high because the response of the instrument to light from an angle of 90 degrees may be as much as 50 per cent, whereas the true readings should be zero at that angle of incidence.

The projection screen brightness can be measured with an incident-light meter as follows: Hold the meter at the center of the illuminated projection screen with the cell almost in contact with the screen. In this position the cell will see only its own shadow. Then pull the meter slowly back from the screen. The reading will increase as the cell sees more and more of the bright screen, but will begin to decrease when the meter begins to see the dark areas beyond the edge of the screen. The best meter reading is the maximum indication and is correct for a cosine-corrected incident-light meter. The scale value in footcandles is actually footlamberts. For meters having the flat exposed cells, such as the G-E DW-types, the reading is multiplied by 1.25. Divide the value in footlamberts by 3.14 to obtain the brightness in candles per square foot.

PREFERRED SCREEN BRIGHTNESS VALUES

The measurement of screen brightness has been the subject of a lengthy and thorough investigation by the Screen Brightness Committee of the Society of Motion Picture and Television Engineers. The work of this Committee was directed toward screens in motion picture theaters for large audiences. At the time of the 1947 report[2] of this Committee, the SMPTE recommendation for screen brightness was between 9 and 14 footlamberts. A survey of the first eighteen theaters showed that approximately 50 per cent of the theaters had screen brightnesses at or below the minimum. The screen illumination varied from a minimum of 7 to a maximum of 30 footcandles. The screen brightness values found by this survey of the Committee are shown in Figure 2.

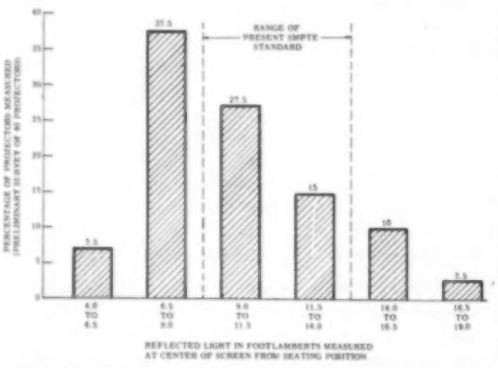


Fig. 2. The 1947 survey of screen brightness in theaters by the SMPTE showed a range from 3.7 to 25 footlamberts.

In theater projectors using arc sources the screen illumination varies a little as the arc burns. To obtain a reliable indication of screen reflectance, the screen illumination and brightness must be measured at the same time. To accomplish this the instrument in Figure 3 was developed. The photometric unit contains two cells. While one cell is aimed towards the screen the other faces the projector. By means of the transfer switch on the instrument, the brightness and illumination can be measured in rapid succession. The average ratio is the screen reflectance.

The reflectance of the projection screens found in the SMPTE survey varied from 47 per cent to 87 per cent. The average was around 70 per cent. Screens used in these larger theaters are usually of the matte type.

The American standard for screen brightness for 35 millimeter motion pictures[3] states: "The brightness at the center of the screen for viewing 35-millimeter motion pictures shall be 10 + 4, — 1 footlamberts when the projector is running with no film in the gate."

A proposed American standard for lantern slide and slide film projection[4] states that the illumination on the screen should be adequate to give a brightness of at least 5 footlamberts. This proposal suggests that the cleanness of the screen be judged by holding a sheet of white typewriter paper against it. If the screen appears darker than the paper, the screen should be cleaned or replaced. The standard further states that the room illumination should not exceed 0.1 footcandle.

An article published in the journal of the Royal Photographic Society[5] suggested that the minimum incident illumination at the center of the screen should be 8 footcandles. A 1947 British article[6] suggested brightness limits of 7 to 14 footlamberts. The British standard is now 8 to 16 footlamberts[7].

In evaluating the performance of exposure meters, the General Electric Company has standardized a screen brightness of 10 footlamberts for matte screens. This value was arrived at through the study of existing data and also by consideration of the amount of light available. Ten footlamberts appeared to be about the brightness available from the average home projector.

An extensive bibliography, containing 83 references on "Preferred Levels of Motion Picture Screen Illumination," has been prepared by the National Carbon Company for use of the Screen Brightness Committee of the SMPTE.

The data indicate a trend toward increased screen

brightness as more powerful projectors have become available. The lower limit of 9 footlamberts appears to have been chosen to obtain the minimum, good-quality screen image. The upper limit of 14 was chosen to give the highest brightness consistent with uniformity of appearance of picture quality between different theaters. The maximum usable screen brightness for motion pictures is said to be limited by factors such as flicker. Image flicker has been reported objectionable, starting in the range between 15 and 30 footlamberts.

Recent tests have indicated that higher screen brightness can be used for color slides than for movies. More light is available because the aperture is larger and flicker is not a problem. Tests of a large variety of scenes, including many close-ups of persons, suggest that the brilliance of the screen image of slides increases up to 50 footlamberts without loss of quality. The preferred exposure for the 35mm color slides examined appeared to be the same for screen brightness between 10 and 50 footlamberts. The increased brightness seemed to increase the observer's tolerance for underexposure.

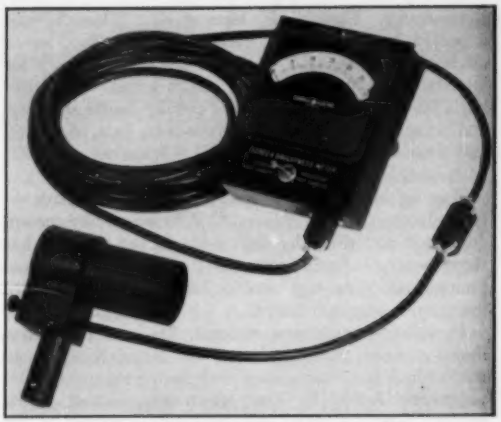


Fig. 3. This screen brightness meter used in the SMPTE survey could measure selectively either illumination or brightness.

REFERENCES

(1) American Standard Z38.7.14—1949
(2) Journal of the SMPE Vol. 50 March, 1948
(3) American Standard Z22.39—1944
(4) Proposed American Standard Z38.7.20 (June, 1950)
(5) "Illumination of Lantern Screens," The Photographic Journal, p. 329, November 1944
(6) "British Screen Brightness Standards," International Projectionist, November 1947
(7) British Standard 1404

New Movie Products in 1951

JACOB DESCHIN, APSA

TO THE long and varied list of available motion picture products the year 1951 to August 1 has seen the introduction of a rather impressive array of new items. Here is the round-up, something for nearly every moviemaker.

Cameras, as usual, lead the field. Movie "snapshooting" as simple as with the good old box Brownie was Eastman Kodak's goal in putting out the Brownie Movie Camera, 8mm "box" using 25-foot rolls of double-eight film. The price is $47.50; a field case with drop front, $4. Features are: 13mm f/2.7 coated universal-focus lens; one camera speed, 16 frames per second; built-in exposure guide and diaphragm control; footage indicator; locking button; and parallax-corrected viewfinder.

Keystone Manufacturing Co., which a short while ago began to restyle and to streamline its movie cameras in the modern mode, continued the trend in 1951 with four new units, to which it has given name as well as number identities—a new departure. All bound in rich brown leather with chrome trim and attractively designed, the new cameras are a far cry from their humdrum ancestors of yesteryear. The new Keystones are the Riviera 8mm in single-lens and turret models, the Mayfair 16mm two-lens turret magazine camera, and the Criterion deluxe 16mm roll turret camera taking 100-foot rolls.

Bell & Howell Company came out with two new cameras, an 8mm and a 16mm. The first is a new addition to its Sportster series, the 134-V, a spool-loading camera costing $109.95 and equipped with the ½-inch f/2.5 B&H Comat universal-focus lens. With the ½-inch f/1.9 B&H Super Comat, $139.95; with the ½-inch f/1.4 TTH Ivotal, $194.95, both in focusing mounts. All lenses are coated. Features include a new viewfinder, improved exposure calculator and "drop-in" sprocketless loading.

The new 16mm Bell & Howell is the 70-DL, which replaces the models 70-DA and 70-DE. Outstanding feature is the new parallax-correcting viewfinder which has an optical system said to give a 500 percent brighter visual image; telescopic-type optics; focusing eyepiece adjustable to individual eye requirements; new clearance for wearers of eye glasses. With 1-inch f/1.9 Super Comat lens, this three-lens turret camera is $369.95; with 1-inch f/1.4 TTH Ivotal, $459.95; with 1-inch f/2.5 Ansix, $344.95. All lenses in focusing mounts.

A German-made 8mm camera, the Nizo (made in

Germany by Niezoldi & Kramer Co., Munich, and imported here by Ercona Camera Corporation), has a double lens mount on a slide that shifts up or down for interchanging standard and telephoto lenses. The Nizo has a 90-degree angle finder for "candid" movie shooting, and attachment for fade-ins, fade-outs, laps, dissolves, and other effects. With coated f/1.9 Schneider, $195.50; with coated f/1.5 Rodenstock, $219.

Way up in the price bracket—$4,315.65 less lenses—is the 16mm Auricon "Super-1200" sound-on-film camera (designed and made by Berndt-Bach, Inc.), which has three separate finder systems—through-the-camera-lens ground-glass focusing; studio finder showing upright image, and telephoto finder.

In addition to its new cameras, Keystone also introduced a novel movie projector, the Regal K-109 8mm outfit which is a combination projector-editor-splicer. Its uniqueness lies in its base, which incorporated a film splicer. The film gate, lamp and optical system of the projector are used as the editor. The splicer fits in the sliding drawer in the base, hidden when not in use. The handy base also has a socket to which a table or floor lamp may be connected; an inter-locking switch turns the lamp off when the projector goes on, and vice versa. With lift-up type plywood leather covered case, the projector is $149.50. A similar unit, the Belmont K-161, for 16mm use, is the same price.

Another new projector, the redesigned model of the RCA "400" Junior 16mm sound projector, which is now smaller and nearly ten pounds lighter, was announced by the RCA Engineering Products Department, Camden, N. J. The RCA "400" Senior also was improved. Externally mounted speakers are offered in several types for both models. A 2-inch f/1.6 coated lens, and 750-watt lamp, spare reel and other accessories are standard equipment for both projectors. For "live" comment or for playing phonograph records.

In the lens field, Zoomar Corporation, New York, introduced the Reflectar lens, an optic of high correction and resolving power, in a 40-inch focal length with f/8 wide aperture. The lens is designed for 35mm motion picture cameras and 35mm still cameras. Accessories include devices for stopping down the lens aperture by hand or by remote control, for convenience in mounting filters, and for viewing and focusing.

Bell & Howell added two new lenses for 8mm cameras; the 1½-inch f/1.9 Super Comat Telephoto (Taylor, Taylor & Hobson), and the B&H wide-angle ¼-inch f/1.9, priced $99.95 and $79.95, respectively. The telephoto has a red engraved depth-of-field scale and focusing mount calibrated 2 feet to infinity in fourteen stops; spread-out iris scale with click stops to f/22. The wide-angle has a fixed focus at 4 feet, click stops, drop-in filter ring.

The Elgeet Optical Company, Rochester, N. Y., came up with a fast, coated 7.5mm f/1.5 ($77.85) for use on 8mm cameras. The lens covers four times the area of the standard ½-inch; has click stops and filter retaining ring, and focuses down to 1½ feet. A 3-inch f/2.9 focusing Platar coated telephoto was introduced by Photographic Arts Manufacturing Corp., New York. The $54 lens is hard coated and has an adjustable flange for resetting the calibration in any desired position for convenience.

Ansco made news by releasing its long-rumored 8mm Ansco Color movie film. Packed in 25-foot "double-eight" magazines and rolls, the one at $4.50, the other at $3.75, the film was first being made in daylight type only; tungsten type will follow later. Simultaneously, the company released 16mm Ansco Color, daylight type, in a 50-foot magazine load costing $6.75. The new 8mm film is said to retain the soft gradation characteristic of 16mm Ansco Color, but is a redesigned version with a finer grain than that of the larger movie film.

Accessories on the new shelf were varied and attractive. Paillard Products, Inc., New York, importers of the Swiss Bolex cameras, unveiled the Bolex Titler for 8mm and 16mm titling. The handsome device has a sliding carriage and rack-over for all 8mm and 16mm movie cameras and for stills up to view camera size. A wide variety of accessories permits more than twenty types of trick effects in addition to "zoom" shots. For horizontal or vertical use. Titler and accessories, in case and box, $345.25. The Basic Bolex bench, in case, with 30-page manual, is $180.25. Accessory kit alone, $165.

Way down in the price scale was the Magic Master Letter Set offered by Joseph Struhl Co., New York. The $9.95 set consists of 480 plastic letters, numerals and figurettes that stay put when applied to the 17½ x 23½-inch titling easel. No adhesive, comes off readily, no close-up lens attachment needed. The easel, which is held upright by special wood bases, is jet black on one side, brilliant red on the other, for black-and-white and color movies, respectively.

An enlarger for movie frames was the news from Minox, Inc., New York. The makers of the Minox still 9.5mm camera offered the Minox Model III enlarger, equipped with a 15mm Hensold anastigmat lens at the fixed opening of f/3.5, a 110-240-volt transformer; a 6-volt 30-watt special projection lamp, dim and bright switch, rheostat control, and projection board of dark rubber. The $195 enlarger has a variable mask, for 8mm, 9.5mm and 16mm frames.

A 16mm double-system editor for editing picture film and sound track was made available by M. W. Palmer, New York. Separate film channels for sound and picture permit separate or interlocked control.

Mayfair Manufacturing Co., Brooklyn, N. Y., placed on the market the Foldomatic four-light bar-type unit, with full lamp spread of 26½ inches, closed length of 12 inches, and weight of 2½ pounds. The arms move horizontally in a 180-degree swing; sections, holding two sockets each, rotate 350 degrees. The control box has a four-position rotary dimmer switch. Price, $14.95. A smaller, two-light Foldomatic Pocket model, is $10.95.

A four-lens turret and rack-over for the Bell & Howell series 70 cameras was introduced by Par Products Corp., Hollywood. Features are: full-frame ground-glass focusing through taking lenses; behind-the-lens filter slot, and focus compensator for critical focusing with or without

(Turn to page 708)

The Stereoscopic Art—Part 1

J. A. Norling, APSA *

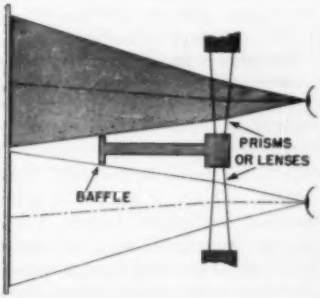
Introduction

An accelerated interest in stereoscopic photography has been inspired in recent years by the appearance of compact, well-designed cameras and viewing devices marketed at moderate prices. These new products and their increasingly widespread use support the belief that any art such as stereoscopic representation depends for popularity, indeed for survival, on the equipment available to enable people to practice the art.

That an appreciation and understanding of stereoscopic vision has existed for a long time is evident from Euclid's definition:

> To see in relief is to receive by means of each eye the simultaneous impression of two dissimilar images of the same object.

On this definition by Euclid (280 B.C.) the entire stereo art is based. And that stereoscopic representation has long been practiced is borne out by the stereoscopic drawings of Giovanni Battista della Porta around the year 1600. How della Porta's drawings and similar drawings of other artists of that era were viewed is not known. But it is well known that the popularity of stereoscopic pictures reached a peak about 50 years ago when the stereoscope was virtually a parlor fixture. Now, although the parlor stereoscope is instead a museum piece, the art of stereoscopy appears to be flourishing again as it did half a century ago—with one principal difference: It is a participating art instead of simply a spectator art. More and more people are not only viewing three-dimensional pictures, but they are taking them with their own cameras. The popularity of stereoscopic photography looks as if it is here to stay. With a wider appreciation of its possibilities, and with an increasing number of camera enthusiasts trying their skills at stereoscopy, its possible eventual widespread acceptance as the ultimate form of photographic realism may one day come about.



Illustrating the principles of the Brewster Stereoscope. This arrangement for prisms was used for pictures whose centers were farther apart than the normal human interocular.

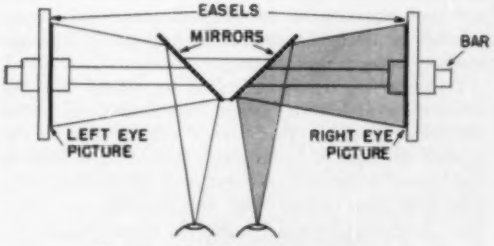


Diagram of the Wheatstone Stereoscope.

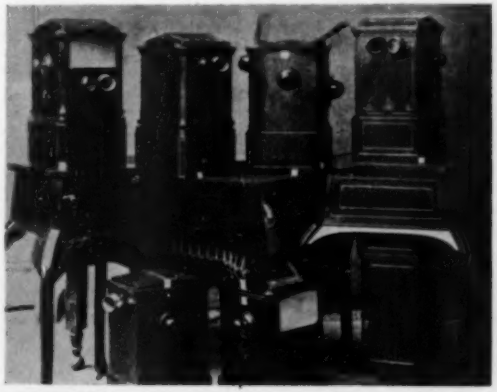
Early Viewing Devices

One of the first known viewing devices was the Wheatstone Stereoscope, which was described before the Royal Society in 1838 by Sir Charles Wheatstone sixteen years after Niepce produced the first permanent photographic image. This instrument supported a pair of pictures on easels clamped to a bar, one at each end. Midway between the pictures were mirrors facing them. The observer saw the reflected images and was able to fuse them provided they were properly spaced and aligned. But its unwieldiness contributed to its lack of popularity.

The first practical stereoscope was invented by a Scotsman, Sir David Brewster, who introduced it in 1849. This was modified by Oliver Wendell Holmes some years later in America. In its early form, the Brewster stereoscope contained a pair of prisms which, in 1856, were replaced by segments of a convex lens. The Brewster and Holmes stereoscopes were used for viewing paper stereograms. Later, several Europeans brought out a large variety of viewers for transparencies, frequently in elaborate cabinet form.

Just about the time Brewster's first stereoscope was

* President, Loucks and Norling Studios, Inc., New York City.



A variety of early cabinet stereoscopes. Courtesy of Robert N. Dennis.

A Stereoscopic Daguerreotype with lens stereoscope.

introduced, there appeared some stereoscopic Daguerreotype portraits and novel lens-holding viewers. The accompanying illustration of one of these stereogram products is provided through the courtesy of Mr. Douglas Stapleton. It is mounted in a handsome case, provided with a viewer containing a pair of convex lenses, with centers spaced two and one-half inches apart. The pictures, peculiarly enough, are spaced only two inches apart, introducing a little difficulty in viewing, but fusion can be attained. The name of this device is "Macher's Improved Stereoscope," patented March 8, 1853. It was made in Philadelphia.

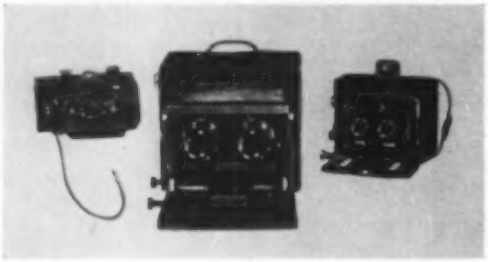
Unfortunately, many stereoscopes had "eye-strain" as a built-in feature. Many stereograms were poor in definition and contrast, and sloppily mounted. These faults, working together, probably was one reason for the loss of popularity of the stereoscope.

Amateurs who still kept alive their interest in stereoscopy had to perform a number of operations not required in ordinary photography, such as the transposition and mounting of the pair of pictures. These requirements made many give up the pursuit of the art.

Oliver Wendell Holmes called a photograph "a mirror with a memory," and it was this pioneer in the art who christened the stereoscopic picture "sun sculpture." The "sculpture" in a stereogram is tenaciously remembered and details are retained that are soon forgotten in a "flat" picture.

Binocular Vision

The sensations received by the eyes are transmitted to the brain where, in a psychic assembly room, the two disparate images are fused together, so that we become conscious of relief in the view. But fusion cannot be accomplished without strain unless the two images are of exactly the same size and the "picture" axes aim at the same points. Inability to fuse exists in an eye disorder called "diplopia" in which double images are seen, and in "anesikonia," the term applied when the eyes form images of different sizes or shapes.



Three stereoscopic still cameras. Left—Richard. Center—Stereo Graphic. Right—Ica.

The Stereo Still Camera

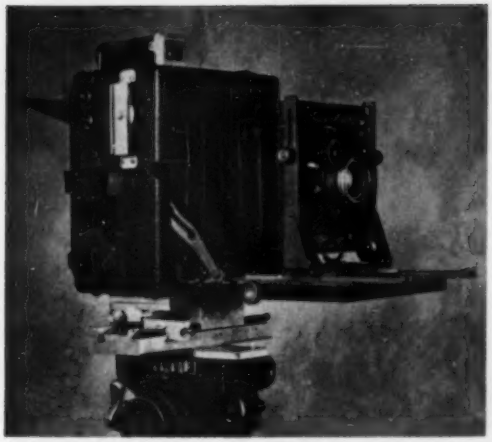
A stereoscopic camera not having matched lenses can be said to have "anesikonia," as can projectors with unmatched lenses. If the images on the screen do not align properly, the projector has "diplopia," and the observer's eyes will have to perform acrobatic feats to attain fusion, and in the process, will suffer strain. Veracity in a stereogram exists only if it is taken properly.

Stereoscopic cameras were made in scores of styles throughout the past hundred years. Among the most widely used American stereoscopic cameras was the Stereo Graphic with a focal plane shutter. It took the stereoscopic pair on a 5" x 7" plate.

The Europeans, principally the French and the Germans, have been very active in stereoscopy and have produced a wide range of cameras and other stereoscopic devices. A well-designed French camera was the Richard Verascope, which accommodated both plates and roll films. Separate magazines were furnished for each. The one shown in the accompanying illustration took the pictures on 7 x 13 cm plates; Verascopes were also made in 6 x 13 cm and 45 x 107 mm sizes. A single guillotine-type shutter operates between the elements of their two lenses. Shutter speeds up to 1/120 of a second were provided.

Other similar European cameras made pictures a good deal smaller than the original Richard, but some made pictures as large as 3½" horizontal and 4½" vertical. The German Ica contained a valuable feature usually overlooked by makers of stereoscopic cameras. This was a provision for changing the lens spacing for principal objects at different distances. The Ica's lenses move toward each other, reducing the lens interaxial when focusing on a near object, and spread farther apart when focusing on a far object. This is a feature of great importance and is discussed later in some detail. Probably, other stereo camera makers will some day make devices to provide the highly useful and often necessary varying interaxial. If it were built into the camera, there would be no necessity for using smaller slide masks that cut down the sides of the image to attain satisfactory viewing, as we find recommended practice for closeups made by many modern cameras.

Undoubtedly, the camera most responsible for the resurrection of interest in the three-dimensional art is the Stereo Realist. This camera was the first in the modern development of the stereo art which has features that appeal to amateur photographers, particularly those who have been making color transparencies on 35mm film. Like most popular "single-eye" miniature cameras, the Realist has coupled range-finder focusing, easy-to-



Single lens camera mounted on a slide board.

learn controls, and in contrast with earlier cumbersome cameras, it fits the hand.

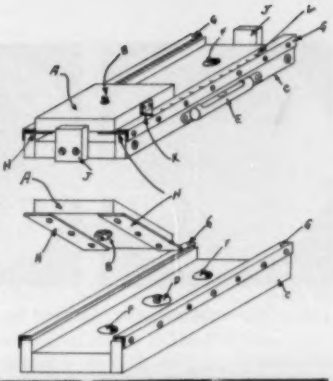
"Slide Board" for Stereo Still Lifes

A single lens camera can be used to make stereoscopic pictures of still life subjects by mounting one camera on a "slide board." Because only a single lens is used, both images will be of exactly the same size, and there will be none of the faults contributed by a pair of unmatched lenses. The slide board may be a simple one made of wood, but the precision provided by metal construction is much to be preferred. Slide boards can be made as long as desired, but there is little use for one that permits a camera shift of more than three or four inches, except for very special purposes.

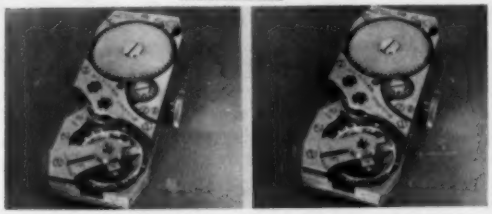
With a slide board, closeup stereograms can be made of objects so small and so enlarged, that the interaxial spacing may be only a few millimeters. The slide board enormously extends the range of effects offered by stereoscopic photography, and it is an economical and convenient method for the person who would like to start in stereoscopy without first buying a two-lens camera.

Kennedy Stereo Camera

Even without a slide board, the single lens, if its aperture is large enough, can be employed to produce stereograms of excellent quality. Its usefulness seems to fall only in the still-life field, since the effective aperture employed for each image is of a rather low order. The system is simplicity itself, and was designed and built by Professor Clarence Kennedy of Smith College, in cooperation with Dr. Edwin H. Land and Otto E. Wolff. Professor Kennedy had employed it principally to obtain large stereograms of sculptures. Its diagrammatic representation shows that only a part of each lens is used for forming each member of the stereoscopic pair. If the lens has a large enough diameter to accommodate the desired result, the two individual lens "stops" can be separated to the required spacing called for by the geometry of the stereogram's planned use. A lens of



A simple slide board: a—sliding member, b—camera screw (¼-20), c—main body, d—bushing for tripod screw, e—spirit level, f—holes to clear screw driver so camera may be attached to "a" from below, g—angle brass, h—brass strip, j—stops, k—pointer, l—scale (paper or cloth tape).



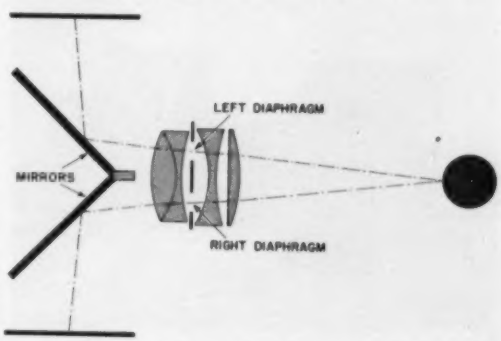
Stereogram of a watch movement. (Lens interaxial 5mm.)

large diameter, 75mm or more, must be used. Its focal length is determined by the type of stereograms to be made. A large diameter demands a lens of long focal length. Consequently, this particular process is limited to still stereograms. Because of the large size of many stereograms used this way, projection would introduce many problems. Viewing boxes are used instead.

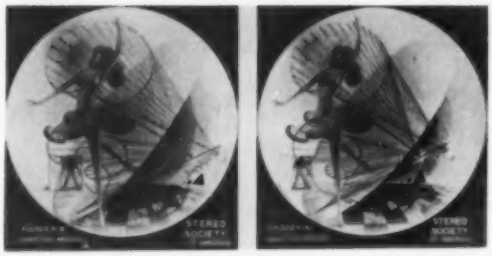
Stereographic Drawings and Paintings

A more or less obscure form of the three-dimensional art is the rendering of stereographic drawings and paintings. As a teaching aid, Professor John T. Rule, of the Massachusetts Institute of Technology, has introduced such novel drawings for celestial navigation and solid geometry. They provide the student an unusually effective portrayal of spatial relationships. Some of Professor Rule's drawings have been published in vectograph * form as an adjunct to classroom texts.

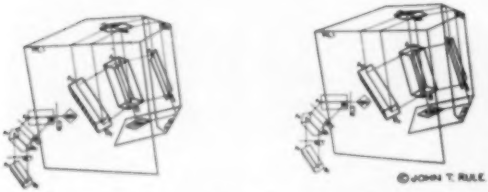
* The vectograph method is discussed later in this article.



Illustrating the principle of the Kennedy stereoscopic single lens camera.

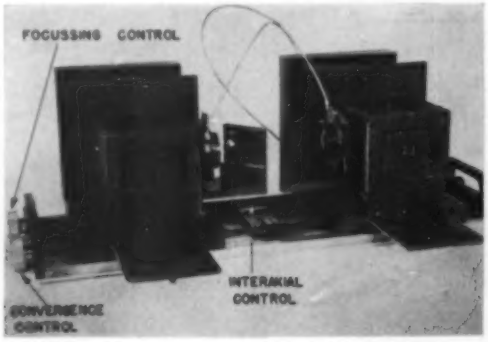


Stereoscopic painting. Courtesy Paul H. Stone.



A Stereographic drawing illustrating a geometrical problem. Courtesy Prof. John T. Rule.

A stereoscopic camera in use. (Circa 1900.) Courtesy Robert N. Dennis.



A versatile still stereoscopic camera, one of several designed by the author.

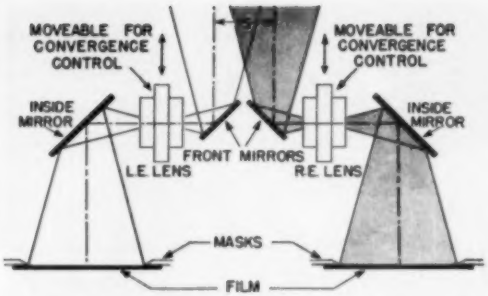


Diagram illustrating the arrangement of components of a special still picture stereoscopic camera.

In the illustration field, Mr. Paul H. Stone has produced a number of striking stereograms. With his kind permission, we are able to publish one of his remarkable creations which he has entitled "Clinical Study of How Stereo Registers to the Brain." Mr. Stone has a theory which makes interesting reading on the subject of how the eyes work:

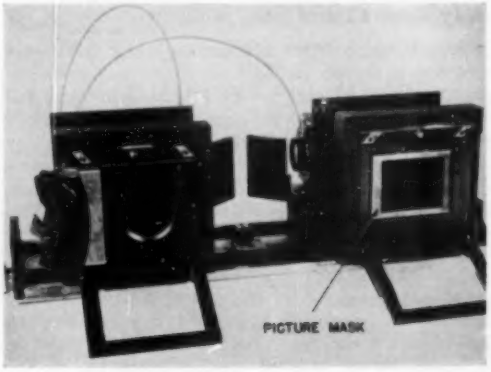
Our two eyes scan every pin-point of a scene, as rapidly as a television beam; from top to bottom, side to side, and, most important, from near to far. It is less the focus of each cornea than the convergence of the two beams of vision which telegraphs a sense of depth, of distance to the brain.

I believe the actual muscular pull on the eyeballs, whether they are crossed toward each other or straightened to parallel, and infinity, is the recording device which informs the brain about the length of the convergent triangle. Hence the brain can infer with reasonable accuracy, depths, from a few inches to the better part of a mile.

Versatile Stereo Camera

While the amateur has available a wide selection of stereoscopic cameras and accessories, there are no well-designed cameras for the professional. If he wants to go into stereoscopy, virtually the only thing he can find is an old Stereo Graphic in a second hand store, or if he is fortunate, one of the excellent Icas. But neither of these has all the features required by the serious worker.

A professional stereoscopic camera should contain, as principal features, a means for varying the lens interaxial



Rear view of camera, showing the picture mask.

and a means for converging the picture axes on any desired plane.

Probably the easiest way to show what a versatile stereoscopic camera is like is to describe one of several types designed by the author. The diagram shows the plan view layout. The assembly comprises two camera bodies mounted on a common base. Each has its own lens, but the lenses are mounted in a unique way, pointing off at right angles, one to the left, the other to the right. In front of each lens is a first surface mirror whose face is 45° to the lens axis. A right hand—left hand screw provides a means for moving the camera bodies together or apart, thus controlling the interaxial spacing. This spacing can be varied from one and one-half to six inches, permitting satisfactory setting for objects as close as four and one-half feet, using 7 inch lenses. The assemblies which carry the lenses and front mirrors are moveable for a small distance forward and backward. This makes it possible to converge the picture axes to any plane desired. The images are framed within metal masks which are mounted so they can retract for the insertion of the film holder's dark slide. These masks accurately define the picture areas, and if the convergence control is properly used, the masked margins provide precise registration for mounting. It should be emphasized that precise alignment of the pictures is an absolute requirement for projected stereograms. If not precisely aligned, the three-dimensional pictures cannot be viewed with complete visual comfort, and the goal of the serious worker is and should be nothing short of complete visual comfort in viewing.

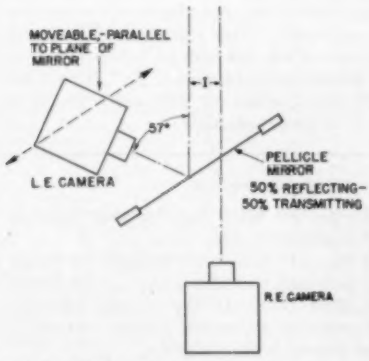
The mask on the right has a small hole close to the picture area that permits a cue mark for the purpose of quickly identifying it, thus facilitating the assembly of the pairs. This camera is used mostly for making color three-dimensional slides, although it has been used to make master black-and-white negatives for vectographs and anaglyph stereograms.

One arrangement that can be employed to attain the variable interaxial feature is illustrated. In this arrangement a partially-reflective, partially-transmittive mirror is used, one camera being placed behind the mirror, the other being placed so that it receives the image by reflection from the partially silvered first surface of the mirror.

This method permits the interaxial to be varied from zero to the limit permitted by the size of the mirror. Of course, the "left eye" camera (in the arrangement shown) will have its image reversed left for right, but that is unimportant because the negative can be turned back to normal in printing.

The mirrors should be the pellicle type, such as are used in some color-separation still cameras. Satisfactory results have been obtained with thin glass mirrors, 1/32" thick or thereabouts. A thick glass mirror cannot be used because a second reflection will show in the image picked up by the mirror. If a thin glass mirror is used, the secondary reflection will not be separated far enough from the primary image to become discernible if the mirror is mounted at about 57°, as shown in the diagram.

If a pellicle mirror is used it must be mounted in a frame that will afford the facility for stretching it taut.



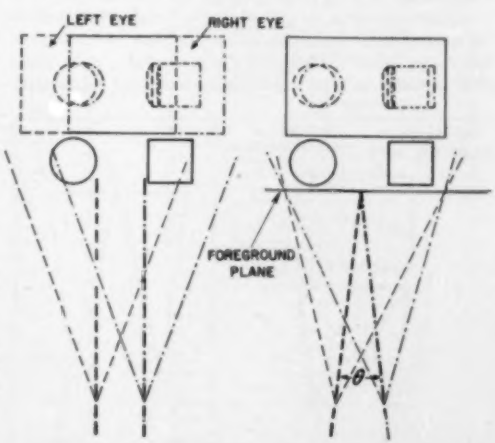
Illustrating an arrangement that provides a variable lens interaxial using a partially transmitting pellicle mirror.

Taking Stereo Still Pictures

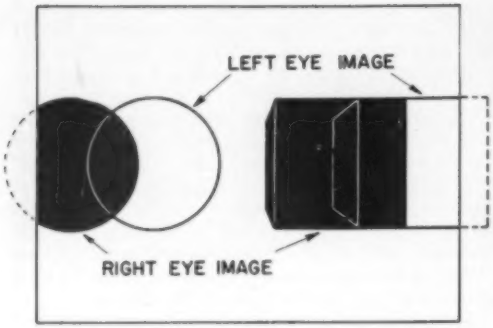
The stereo still photographer is confronted with just about the same problems as the conventional still photographer, plus a few extra problems that are peculiar to stereo. Interocular distances, interaxial distances and convergence problems are some of the extras which lie only in the province of stereo. But they are soon mastered and the pleasure derived from their mastery is rewarding indeed.

A difference in focal length between the lenses of a stereo camera of more than one-half of one per cent will produce images differing enough in size to cause eyestrain when pictures are projected.

If glass filters are used on the lenses, there may be enough "wedging" in the filter assembly to throw the picture axes out of line. This is not serious if the misalignment is along the horizontal, but it may be significant if it is along the vertical, and when the pictures are projected, it may be found that they have disturbing vertical displacement between them. This "vertical" may not produce a vivid consciousness of eyestrain, but it may very well produce enough effect to tire the observer after a time. As J. M. Dalzell has said, "Any sensation



Left—The side margin effect with non-convergent lenses. Right—the effect with lenses converging on a foreground plane.



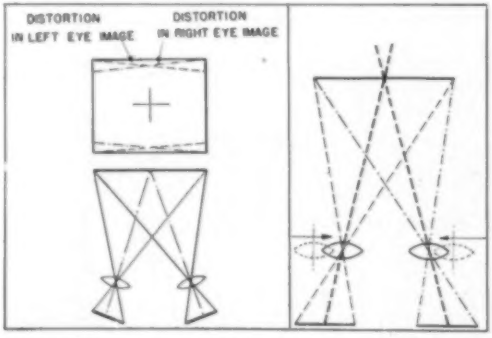
Illustrating how nearby object images are cut off when image axes do not converge on objects.

of visual lassitude, discomfort or even slight pain, is a psychological and mental affair. It is the penalty for exceeding certain geometric limitations which Nature has imposed upon the use of two eyes simultaneously. Its cause is cumulative and lies in the breaking—of one or more of a few exceedingly simple rules—"

To avoid eyestrain, all elements in every plane must have crisp definition such as good eyes provide in their wanderings from plane to plane when looking at a scene. Out-of-focus or "soft focus" areas, whether in foreground or background, are an abomination that prevents visual comfort in viewing the stereogram.

Since the normal 2½" lens interocular ordinarily should be used on objects no closer than about ten feet, it is apparent that a properly made stereogram can be taken only in a camera having a variable interaxial. Of course, some shots may benefit from a larger interaxial than normal, particularly in cases where an increased depth is considered a dramatic embellishment. By increasing the interaxial several times normal, the depth of such stereograms can be startlingly exaggerated.

The variable convergence feature is a "must" on any versatile stereoscopic camera because it permits the arrangement of each picture within the desired area. To be able to converge to any plane, preferably in front of the nearest object, eliminates the marginal disturbances that occur when the lens axes are parallel. Such marginal disturbances are particularly annoying when they exist in the projected stereogram. The ideal stereogram should be a "real-life" view as seen through a window. Therefore, no object should be permitted to invade the plane where the window exists if that object "touches" any part of the window frame. If it does, the result is a distracting border which gives non-coincidental image reconstitution.



The distortion resulting from the "toe-in" of camera lenses, left. Right—A method of convergence to overcome distortion.

If the "window" is at infinity, as it will be with parallel lens axes, the illusion will be that foreground middle distance and part of the far distance planes are between the window and the observer, a totally abnormal effect.

To create a proper window illusion the masks framing the images must be identically alike in shape and size and their horizontal margins must be level.

Masks can be of any shape. For instance a key-hole mask will provide a stereoscopic view through a key-hole, an anomalous effect since key-holes are so small that real-life peering through one is limited to one eye.

Where objects do not touch the window frame (the picture margins), they can be permitted to come through the window and even made to seem suspended in space between the screen and the observer. In table top photography, one can produce this effect by mounting the subject on glass, being sure it is well inside the picture area and not touching its margins at any point. Convergence is made to occur behind the subject. Viewing comfort is then readily achieved.

Convergence is best accomplished by moving the lenses, not by "toeing-in" the camera bodies. Toe-in introduces a "keystone" distortion that makes the right edge of the left eye picture shorter than the left edge, and the left edge of the right eye picture shorter than its right edge. This kind of distortion may not be considered important, and will be tolerated by some people, but it is one of the things to be avoided if the stereo worker wants to insure that his projected stereograms provide complete visual comfort.

To make a satisfactory stereoscopic picture, the camera must be level and to project the images successfully, there must be no vertical displacement between them and they should not "rotate" one with the other. In other words, the angular alignment has to be the same for both members of the pair.

We may work our interaxial problem out by "rule of thumb." Stereograms that are perfectly acceptable, if properly framed in projection, can be made by taking pictures only of objects further than 50 times the interaxial employed. (This is for camera lenses of the medium angle usually employed.) This rule limits the nearest object to a distance of ten feet with an interaxial of 2½ inches. It is violated to an extreme if 2½" is used for a 5 foot distant object, where the indicated interaxial is 1¼ inches. *(To be continued)*

DESCHIN *(Concluded from page 702.)*

filters. Includes positive turret indexing and "constant apparent field" viewfinder system.

The Panrite No. BG gear-drive panhead for movie cameras ($7.95 plus tax) was offered by Testrite Instrument Co., Inc., New York. It may be used with any amateur movie camera on any standard tripod. Model C, without the gear feature, is $2.95 plus tax.

psa JOURNAL PART 2

Devoted to News and Notes of the Photographic Society of America

Vol. 17 No. 11

Who's Who in Pictorial Photography

1950-51

H. J. JOHNSON, FPSA

THIS IS the second publication of the annual "Who's Who in Pictorial Photography" and is one of a series of three similar lists, the other two being those for nature photography and color slides, appearing in the August and September issues of PSA JOURNAL.

The purpose of these lists is recognition of photographers who have demonstrated better than average ability by obtaining acceptance in at least two of the higher standard exhibitions. Each list is complete in that all photographers who meet requirements in that field (color, nature, pictorial) are listed, whether or not PSA members.

The color list is prepared by the Color Division, the nature list by the Nature Division, and this pictorial list by the PSA Camera Clubs Committee. (There is no intention to use weighting factors or any other "interpretive" methods in any of the lists.)

The exhibitions to be included in the following list were furnished us by the Pictorial Division. Each of these shows had agreed to follow recommendations by that Division. Undoubtedly there are other shows which deserve listing and these will be given opportunity during the current season to demonstrate that they belong in the list. The following are the shows on the Pictorial Division list, approximately in the order of their exhibition dates: Memphis (1950), Dixie, Asheville, Victoria, Sao Paulo, Hartford, Illinois State Fair, North American, Vancouver, Mysore, Northwest, Houston, Western Ontario, Oklahoma City, Irish (Dublin), Milwaukee, PSA, Pasadena, Victoria (Canada), Chicago, Evansville, Columbus, Santiago, Arizona State Fair, Mississippi Valley, Canberra, Springfield, Cuba, Des Moines, Detroit, Wilmington, Minneapolis, Manitoba, Circle of Confusion, Rochester, Great Falls, Philadelphia, Pittsburgh, Worcestershire, Montreal, Port Colborne, Reading, Seattle, Boston, Louisville, Baltimore, Portland, Toronto, Cincinnati, New York, St. Louis, Finger Lakes, Southwest (1951).

Note that there are 53 shows qualifying for listing, compared with 46 last year. Correspondingly there has been an increase in the number of listed exhibitors. In addition to the 704 listed below, there were 975 who were successful in only one exhibition, and hundreds of others who had none accepted.

The Who's Who list is compiled from card files (more than 2500 individual cards) on which are recorded acceptances from various catalogs. Catalog errors, variations in names and addresses, etc., require considerable investigation. Most such irregularities have been eliminated, but if there are any questions these may be addressed to H. J. Johnson, 2134 Concord, Chicago 47, Ill.

Name	*Exh.*	*Prints*
Aalborg, Anders, Memphis, Tenn.	16	20
Abrams, Clarence, Cincinnati, Ohio	2	2
Ackerman, K. G., Berwyn, Ill.	2	3
Acosta, B. M., Saranac Lake, N. Y.	30	59
Adams, Elmore C., San Francisco, Calif.	5	11
Adams, Dr. Glenn, Cincinnati, Ohio	11	23
Adolf, Rossi, Brno, Czechoslovakia	7	10
Adamson, John R., Victoria, Australia	2	4
Agostinelli, Julio, Sao Paulo, Brazil	2	4
Aguilar, Jr., A., San Juan, Puerto Rico	6	6
Aicher, M., Buenos Aires, Argentina	2	2
Albuquerque, F., Sao Paulo, Brazil	3	4
Alderighi, Osvaldo, Sao Paulo, Brazil	2	2
Alford, John A., Los Angeles, Calif.	2	4
Allen, D., Solihull, Warwickshire, Eng.	3	5
Allen, F. C., Oak Ridge, Tennessee	7	9
Altwater, F. Ross, Pittsburgh, Pa.	7	19
Alves, Cardoso C., S. Paulo, Brazil	2	4
Anderson, M.D., J. S., Grand Is., Nebr.	33	69
Andrews, George G., Sunnyvale, Calif.	3	7
Applegate, J. H., Grosse Pointe, Mich.	2	4
Arai, Clarence T., Seattle, Wash.	22	38
Archer, Chas. K., Van Nuys, Calif.	2	3
Archer, Harriette D., Geneseo, N. Y.	9	23
Armstrong, J. Elwood, Detroit, Mich.	10	32
Astor, Mercedes G., Sayville, N. Y.	9	14
Aszmann, F., Sao Christovao, Brazil	2	7
Avramescu, George, Arad, Roumania	7	10
Babu, P.C.M. Eswar, Madras, S. India	3	4
Backhauser, Leslie, Toronto, Ont., Can.	2	4
Bafford, Edward L., Baltimore, Md.	6	18
Bahnsen, Axel, Yellow Springs, Ohio	14	33
Baillot, L. A., Victoria, Australia	2	6
Bain, Warren L., Waynesboro, Pa.	3	3
Baker, H. L., Shrewsbury, England	2	2
Baker, K. H. S., S. Australia, Australia	2	3
Bakonyi, Bela, Budapest, Hungary	3	3
Balint, John S., Bridgeport, Conn.	2	6
Ballentine, G. M., Up. Montclair, N. J.	26	82
Bancroft, Jr., H. G., York, Penna.	11	19
Barcelo, Ignacio, Madrid, Spain	4	7
Bardarson, H. R., Reykjavik, Iceland	3	5
Barker, Henry W., Glenbrook, Conn.	13	18
Barnes, John F., San Jose, Calif.	20	44
Barnes, Kenneth C., Allston, Mass.	3	4
Barth, Harold R., Toronto, Ont., Can.	2	2
Bartlett, Kent W., Glendale, Calif.	3	5
Bates, Herman M., Worcester, Mass.	21	39
Bauer, Jr., Fred, Memphis, Tenn.	15	39
Bauer, Lloyd C., La Canada, Calif.	9	14
Baxter, G. A. H., N. Van., Br. Columbia	3	10
Beach, Harold S., Chicago, Ill.	3	3
Bealmear, Jr., James I., Baltimore, Md.	10	16
Beals, T. H., Park Ridge, Ill.	2	2
Beaumont, N. M., New Zealand	2	2
Beede, Dr. R. W., Youngstown, Ohio	6	9
Behrmann, Enrique, Spain	2	2
Bell, John, Lancs, England	3	3
Belt, Basil A., Great Neck, N. Y.	9	16
Benjamin, J., Manchester, England	17	48
Beran, Jan, Czechoslovakia (Brno)	6	9
Berekmeri, Zoltan, Bekescsaba, Hungary	9	16
Bertens, Eric L., Santiago, Chile	3	6
Bhat, W. N., Poona, India	6	11
Bhatt, Shreedam, Ahmedabad, India	2	4
Bienaime, Jean, Lemans (Sarthe) France	4	5
Biggs, Edythe, Alton, Ill.	23	33
Biggs, Harold M., Alton, Ill.	21	35
Bilney, J., Victoria, Australia	3	5
Bishop, Mike, Woodhaven, N. Y.	10	17
Bittman, Florence R., Jamaica, N. Y.	6	11
Blyth, Alfred, Edmonton, Alberta, Can.	8	19
Bodine, A. Aubrey, Baltimore, Md.	19	68
Bohacek, J., Czechoslovakia (Prague)	12	18
Bohlen, R. J., S. Orange, New Jersey	18	25
Bohuslav, Burian, Brno, Czechoslovakia	6	9
Boisen, L. N., Pelham, N. Y.	6	8
Bolseth, Olgar, Spjelkavik, Norway	3	3
Bonaventure, P., Brussels, Belgium	3	3
Booker, Howard, Los Angeles, Calif.	5	9
Borrall, Joaquin M., Barcelona, Spain	2	2
Borrenbergen, J. Em., Antwerp, Belgium	4	7
Botsford, Gene, Phoenix, Ariz.	3	8
Bott, George W., Birmingham, England	2	2
Bouton, Inez, Houston, Texas	2	2
Bovey, Jr., Martin, Concord, Mass.	2	2
Bow, George, Los Angeles, Calif.	5	9
Bower, John W., Woodstock, Vermont	7	9
Boylan, Frank J., New York, N. Y.	8	15
Boynton, H. Russell, Rochester, N. Y.	6	14
Bradley, Grady A., Phoenix, Ariz.	2	2
Braga, Innocente, Monza, Italy	5	6
Breakfield, C. J., S. Milwaukee, Wis.	3	7
Brenner, K. W., Rochester, N. Y.	11	22
Bricker, Dr. J. S., Vancouver, B.C., Can.	2	6
Briggs, A. W., Victoria, Australia	2	6
Briggs, Eva, Detroit, Mich.	7	16
Broadhead, W., Victoria, Australia	2	4
Bronson, Theodore, New York, N. Y.	38	94
Brooks, Walter H., Rock Island, Ill.	2	2
Brown, Earle W., Detroit, Mich.	33	81
Brown, Harvey W., Los Angeles, Calif.	18	41
Browne, Ross R., Newburgh, N. Y.	3	3
Browne, Wilson, Lancaster, Pa.	15	30
Brownell, D. C., San Francisco, Calif.	8	13
Bruggeman, R. W., Livingston, N. J.	3	6
Brunner, Leon, Buenos Aires, Argentina	2	4
Buker, Charles, Birmingham, Michigan	4	8
Burack, Dr. Abraham, Millburn, N. J.	6	8
Burillo, Martin, Espana	2	2
Burnham, James H., Trail, B.C., Canada	4	5
Burr, C. D., Bitterne, Southampton, Eng.	2	6
Burr, Dorothy, Southampton, Eng.	2	4
Burt-Smith, E., Victoria, B.C., Canada	5	8
Bush, W. E., San Luis Obispo, Calif.	29	57
Buxton, Eugenia, Memphis, Tenn.	44	89
Byers, Dr. Jack, Los Angeles, Calif.	3	5
Calheiros, Pedro, Rio, Brazil	3	7
Calleri, Giovanni, Turin, Italy	2	5
Calvert, Frederic, Chester, Pa.	3	6
Campbell, J. W., Montreal, P.Q., Canada	3	6
Canaday, Ruth, Tulsa, Okla.	3	6
Canby, Edward, Dayton, Ohio	5	7
Capreol, K., Montreal, Que., Canada	3	6
Carney, J. P., Griffith, N.S.W., Australia	14	28
Caron, Raymond, Westmount P.Q., Can.	3	8
Carpenter, Betty, Falls Church, Va.	4	6
Carr, Willard, New York, N. Y.	26	37
Cartwright, R. C., Milton, Mass.	13	34
Casaco, Antonio Rosa, Lisbon, Portugal	12	15
Casbolt, F. L., Christchurch, N. Zealand	4	6
Casneaux, Harold, N.S.W., Australia	2	3
Cesteros, Isaac Galen, Barcelona, Spain	3	4
Chambers, Charles N., Calcutta, India	7	11
Chan, Tom, Hongkong, China	2	2
Chandler, L. G., Victoria, Australia	2	2
Chapman, Vincent, Pittsburgh, Pa.	3	5
Chappell, Robert E., Baton Rouge, La.	5	5

Name	Exh.	Prints
Chappelle, Jr., W. F., Rochester, N. Y.	2	5
Chin, Ark Yung, Seattle, Wash.	4	8
Chin, Que, Seattle, Wash.	5	9
Chow, Sam K., Seattle, Wash.	18	37
Chung, An-Yeung, Hong Kong	3	5
Chung, Ng Ying, Hong Kong	4	4
Clark, Dewey, Quincy, Ill.	3	4
Clark, Everett F., Ridgewood, N. J.	7	8
Clarke, Albert H., Syracuse, N. Y.	3	5
Cleaver, R., Coventry, England	2	3
Clise, Sylvia, Seattle, Wash.	4	5
Cochran, Dr. C. F., Chicago, Ill.	2	2
Cole, Ferd L., Philadelphia, Pa.	5	15
Coleman, R. E., Worcester, Eng.	2	3
Collins, L. G., Chicago, Ill.	3	5
Conway, W. P., Short Hills, N. J.	3	3
Crary, C. J., Warren, Pa.	3	5
Cronhardt, Louis R., Baltimore, Md.	2	2
Crossett, Edward C., Chicago, Ill.	14	22
Csik, Ferenc, Sopron, Hungary	4	5
Csorgeo, Dr. T. de, Budapest, Hungary	13	24
Cuculic, Branka, Chicago, Ill.	4	5
Cummings, Charles, San Diego, Calif.	2	3
Cunday, Morton, Seattle, Wash.	2	5
Cunliffe, Paul R., Chicago, Ill.	3	5
Curtis, Hubert E., Dubuque, Iowa	2	2
Custis, Eleanor P., Gloucester, Mass.	14	39
Dahlby, Glen E., Oak Park, Ill.	23	35
Dalal, Umaprasad S., Ahmedabad, India	3	3
D'Almeida, Jr., A. S., Lisbon, Portugal	2	2
Dan, S. F., Canton, China	4	7
Dauwalter, F. S., Chicago, Ill.	8	13
Davay, Shankerlal, Madras, India	9	12
Davis, Harold R., Elmira, N. Y.	17	27
Day, William C., Springfield, Ohio	10	26
Deaderick, M. M., Carpinteria, Calif.	22	60
Delaney, John P., Coventry, England	4	9
Delfin, Benjamin R., Havana, Cuba	4	7
De Lune, J. M., Rio de Janeiro, Brazil	2	6
de Moya, Angel, La Habana, Cuba	2	5
DeMuynck, A. F., Rock Island, Ill.	4	6
Descamps, Emile, Roubaix, France	2	3
Deskiewicz, Edward T., Philadelphia, Pa.	3	5
Deutsch, Allon, Seattle, Wash.	2	2
De Vos, Peter E., Moline, Ill.	3	4
Dewey, Anne Pilger, Chicago, Ill.	3	4
Dick, J. F., Victoria, B.C., Canada	2	3
Dixon, Glenn, Mount Vernon, Wash.	3	5
Dobro, Boris, Santa Barbara, Calif.	37	111
Dondi, Athos, Bologna, Italy	2	2
Dorr, Catherine E., Brooklyn, N. Y.	5	8
Dudhia, M. G., Ahmedabad, India	3	4
Dundon, L. J., South Australia	2	2
Dupain, Max, N.S.W., Australia	2	6
Du Pont, Durward A., Detroit, Mich.	2	3
Echague, Jose Ortiz, Madrid, Spain	13	39
Edgerton, Dr. R. F., Rochester, N. Y.	30	61
Einhaus, C. G., Quincy, Ill.	2	4
Einon, Julius, Vienna, Austria	3	4
Ellis, Gisela A., Waban, Mass.	5	12
Ellis, Lee A., Waban, Mass.	5	11
Elwell, Jean, Detroit, Mich.	2	3
Emanuelson, Conrad R., Chicago, Ill.	2	6
Endres, J. M., Jackson, Miss.	14	29
Engineer, Dhruva C., Ahmedabad, India	4	6
Enos, F. J., Rochester, N. Y.	2	2
Ensenberger, H. J., Bloomington, Ill.	15	35
Epstein, Semion, Stockholm, Sweden	4	6
Erickson, Harry J., Lincoln Park, Mich.	6	7
Escheneuer, Louis, Vienna, Austria	2	2
Fairbanks, Charles W., Rochester, N. Y.	18	40
Farkas, Thomas J., Sao Paulo, Brazil	2	4
Faught, M.D., F. A., Philadelphia, Pa.	23	32
Fearnley, Bernard, Middlesbrough, Eng.	4	6
Fillmore, F. A., St. Louis, Mo.	2	2
Fiori, Mario, S. Paulo, Brazil	3	5
Firth, Caryl R., Trappe, Maryland	18	33
Firth, Tom, Trappe, Maryland	11	14
Fish, John I., Rochester, N. Y.	26	54
Fix, Jr., Fred W., Chicago, Ill.	10	16
Fleet, M., Toronto, Ont., Canada	3	4
Fook, Kan Hiag, Hong Kong	2	5
Foote, Howard E., New York, N. Y.	18	40
Forgie, Lous Craig, Rochester, N. Y.	22	42
Foster, Gordon, Solihull, England	2	3
Francesconi, Renato, S. Paulo, Brazil	2	2
Frawley, J. M., Victoria, Australia	2	3
Fredrick, Charlotte L., Chicago, Ill.	4	5
Fredrick, W. Howard, Chicago, Ill.	3	5
Fried, John O., Victoria, Australia	2	4
Friedman, Jack, Elmhurst, L. I., N. Y.	9	23
Friedman, Mortimer, Washington, D. C.	2	3
Frisch, Harold, New York, N. Y.	2	4
Frost, Rex, Toronto, Ont., Canada	21	46
Fuller, F. E., Bloomington, Ill.	24	44
Fuller, Ruth, Bloomington, Ill.	2	3
Fung, Yuen-Hon, Canton, China	6	10

Name	Exh.	Prints
Galarraga, L. D. G., San Sebastian, Spain	3	4
Galbraith, J. F., Toronto, Ont., Canada	4	9
Galloway, J. W., Edmonton, Al., Can.	35	74
Ganucheau, L. P. Jr., New Orleans, La.	4	4
Garrison, W. L., Westfield, N. J.	3	4
Gasparian, Gaspar, Sao Paulo, Brazil	3	8
Geer, Jr., M.D., E. T., Englewood, N.J.	21	49
George, Robt. V., Towson, Md.	21	50
Gilchrist, James C., Lanover, Scotland	5	7
Godbole, V. S., Poona, India	5	7
Goldsmith, Henry C., Newark, N. J.	2	4
Goldsmith, Mrs. R., Jackson Hgts., N. Y.	9	18
Goldsmith, Simon, Jackson Hgts., N. Y.	9	12
Gore, Stuart, W. Australia, Australia	2	2
Goughnour, Mrs. Gretchen H., York, Pa.	2	7
Gould, Hal, Loveland, Colo.	2	2
Grasso, Americo, Chicago, Ill.	2	2
Gray, A. G., E. Coburg, Vic., Australia	12	20
Gray, Larry, St. Louis, Mo.	2	3
Green, Newell, Hartford, Conn.	4	7
Gregory, Lloyd L., Dallas, Texas	2	2
Grelland, Alejo, Buenos Aires, Argentina	2	3
Gripman, Ann Marie, Goteborg, Sweden	3	9
Gronek, Harold B., Chicago, Ill.	3	3
Gruber, Ferenc, Sopron, Hungary	2	2
Grum, Germaine Anna, Rochester, N. Y.	3	4
Gunn, Jack, New York, N. Y.	4	7
Hagen, Ethel E., Milwaukee, Wis.	17	28
Haigh, Henry, Stamford, Ont., Canada	2	2
Haist, Dr. Grant M., Rochester, N. Y.	21	35
Hall, Lt. Col. F. G., Fort Dix, N. J.	3	5
Hall, Shirley M., San Marino, Calif.	18	37
Hall, Theodore S., Los Angeles, Calif.	2	4
Hampfler, Gottlieb, Kennett Sq., Pa.	5	17
Hampfler, Hilda F., Kennett Sq., Pa.	2	5
Handley, Ruth, Birmingham, England	2	2
Hankiss, Mrs. S. A., Budapest, Hungary	5	8
Hargreaves, Roy, Toronto, Ont., Canada	12	22
Hart, Hal, Toledo, Ohio	8	19
Hartman, Helen, Chicago, Ill.	3	3
Hartman, Howard A., Chicago, Ill.	9	11
Hartmann, C. R., Victoria, Australia	2	4
Haselwood, Irma, Elkhart, Ind.	36	90
Haselwood, W. E., Elkhart, Ind.	4	8
Hastings, K., N.S.W., Aus. (Balgowlah)	7	10
Hayden, Herbert P., Chicago, Ill.	11	16
Heacock, Esther, Wyncote, Pa.	4	8
Heagy, R. C., Los Angeles, Calif.	2	2
Hedstrom, Trond, Helsinfors, Finland	5	11
Heim, R. B., New Orleans, La.	3	3
Heinrich, A. M., Buenos Aires, Argentina	2	2
Heintz, Charles H., New Orleans, La.	2	2
Heller, Frank J., Bartlesville, Okla.	51	134
Hersey, Col. R. G., Libertyville, Ill.	6	10
Hickey, Noel, N.S.W., Australia	2	2
Hickman, H. C., Southampton, England	2	3
Hill, L. H., Devenport, Tasmania, Aus.	3	3
Hill, Vincent M., Warw., England	5	5
Hindman, Boyden W., De Witt, N. Y.	22	35
Hinrichs, Emil, San Francisco, Calif.	12	19
Ho, Shun Chuns, Canton, China	2	3
Hodgson, John, San Mateo, Calif.	2	3
Hohnjec, Oto, Zagreb, Jugoslavija	4	7
Holik, Karl, Vienna, Austria	2	2
Holm, M., Kyrkbyn, Kinstaby, Sweden	5	14
Holst, Agnes M., Phoenix, Arizona	2	3
Homan, Clarence E., Chicago, Ill.	7	13
Hopkins, John J., Towson, Md.	2	2
Hopkins, J. R., Victoria, Australia	2	4
Horvath, Allan L., Dayton, Ohio	31	94
Howell, Edward T., Wilmington, Del.	2	5
Hruby, K. O., Brno, Czechoslovakia	8	10
Hudson, H. R., Eastbourne, Sussex, Eng.	18	46
Hughes, G. J., Bridge of Alan, Scotland	5	8
Hughes, George J., Stirlingshire, Scotland	2	2
Hulett, Betty Henderson, Chicago, Ill.	31	58
Hunt, Richard B., Greenwich, Conn.	5	7
Hunter, Frank, Churchville, Pa.	3	6
Hut, Sydney, New York, N. Y.	4	11
Hutchinson, W. R., Newburgh, N. Y.	7	9
Hyde, Henry Webb, Dedham, Mass.	6	7
Hyman, Alfred H., Rochester, N. Y.	5	10
Hynes, Paul, Cincinnati, Ohio	12	29
Ibarburu, A. F., San Sebastian, Spain	2	3
Igarashi, Matsutaro, Masudamachi, Japan	2	2
Igersheimer, Alice, Brookline, Mass.	5	5
Irurzun, Pedro, Pamplona, Spain	2	2
Irwin, Charles E., Edgeworth, Pa.	3	3
Ishimoto, Y., Chicago, Ill.	7	18
Israel, Samuel, Seattle, Washington	12	16
Issott, E. N., Bangalore, S. India	2	2
Jackson, C. V., N.S.W., Australia	2	6
Jackson, Ralph, Tacoma, Wash.	2	4
Jackson, William, Hull, England	14	25
Jarai, Rudolph, Budapest, Hungary	10	17
Jennings, Philip R., Mt. Vernon, Wash.	2	6
Jentgen, Rene, Luxembourg	17	39

Name	Exh.	Prints
Johantgen, E. G., New Castle, N. H.	9	12
John, Joseph N., Philadelphia, Pa.	5	9
Jones, Maxine, Canton, Ohio	8	11
Jones, Jr., Thomas Carl, Akron, Ohio	2	3
Jono, S., Saga City, Sagaken, Japan	2	3
Jordy, Florence, Madison, N. J.	28	60
Jowett, Clinton B., Santa Barbara, Calif.	2	2
Kahon, Fred C., Philadelphia, Pa.	23	49
Kalmar, Hugo, Buenos Aires, Argentina	3	4
Kamin, Alfred, Evanston, Ill.	2	2
Kan, Hing-Fook, Hon Kong	2	7
Kanitkar, M., Poona, India	4	7
Kanitkor, Sham, Poona, India	3	7
Karlsten, Evald, Goteborg, Sweden	2	3
Karoly, Kovacs, Sopron, Hungary	2	2
Keith, Edward W., Windsor, Ont., Can.	11	12
Kennedy, Miss Jan, W. Australia, Aus.	2	2
Kennedy, Joe E., Tulsa, Okla.	22	56
Kahn, H., Poona, India	4	7
Kiess, Arthur, Schenectady, N. Y.	2	3
King, Barton, Flushing, N. Y.	22	43
King, A., Pearce, Baltimore, Md.	2	3
Kinkade, Geo. L., Auburn, Wash.	2	5
Kisling, Vernon N., Baltimore, Md.	10	25
Klarquist, H. T., Minneapolis, Minn.	4	8
Knight, F. W., Birstall, Leicester, Eng.	2	5
Knutson, Ben M., Alamosa, Colo.	3	3
Koeniger, Hugo, Kenmore, N. Y.	4	13
Koller, Franz, Vienna, Austria	4	8
Kotzebue, Leon L., Seattle, Wash.	2	3
Kral, Frantisek, Zapova, Czechoslovakia	2	3
Kunkel, Karl F., New York, N. Y.	17	32
Kursheed, Hameed M., Lahore, Pakistan	3	3
Kushi, Tomojiro, Seattle, Wash.	3	3
Kwong, Lau Wai, Hong Kong	5	7
Lao-sun, Wang, Chungking, China	2	2
La Pelle, Dr. R. R., Philadelphia, Pa.	6	17
Latorre, Carlos F., Sao Paulo, Brazil	3	5
Lauter, Wolf, Santa Barbara, Calif.	4	5
Laws, A. V., Skipton, England	2	2
Lazi, Franz, Jr., Stuttgart, Germany	2	2
Leach, Karl, S., Pittsburgh, Pa.	2	2
Le Blanc, R. J., West Hartford, Conn.	9	12
Lee, W., Bronx, New York, N. Y.	25	75
Lenix, Blanche M., Wichita, Kansas	9	13
Lenix, Martin W., Wichita, Kansas	5	8
Lerch, Leo S., New York, N. Y.	19	69
Letts, Evelyn, San Francisco, Calif.	8	12
Leung, Cho-Tak, Canton, China	2	7
Lewis, Warren W., Chicago, Ill.	18	26
Lichten, Earl B., Chicago, Ill.	16	20
Lievre, Henri, Lyon, France	2	2
Limborg, Thomas, Minneapolis, Minn.	17	39
Lindahl, Roy E., Drayton Plains, Mich.	22	88
Lindstrom, Nils, Ljungby, Sweden	3	7
Litwiller, Duane R., Boston, Mass.	18	47
Litzel, Otto, New York, N. Y.	6	8
Logie, D., Grahamstown, South Africa	2	4
Lok, Chak-Sing, Canton, China	3	6
Longacre, J. Meredith, Moline, Ill.	6	9
Lookanoff, V. A., M.D., Detroit, Mich.	8	27
Loomis, Roger C., Suffield, Conn.	2	3
Lopez, Toca Evelio, La Habana, Cuba	6	8
Lorca, German, Sao Paulo, Brazil	4	7
Lord, Gordon H., Mc Gregor, Iowa	6	6
Lorence, Eugene E., Buffalo, N. Y.	3	3
Love, Dr. L. A., Melbourne, Australia	2	7
Loygorri, Jose, Madrid, Spain	5	5
Luce, C. F. Jr., Atlanta, Ga.	17	38
Luce, Ralph W., Berkeley, Calif.	2	4
Luke, Monte, N.S.W., Australia	2	4
Lum, Gilbert H. C., Honolulu, Hawaii	9	15
Lundberg, Godfrey, Winnetka, Ill.	2	3
Lyon, Dr. R. H., Victoria, B. C., Canada	2	3
Lyons, Leo A., Pt. Kembla, N.S.W., Aus.	7	12
Lyshol, P. P., Sykkylven pr. Ale., Nor.	3	4
Machado, Euclides, S. Paulo, Brazil	2	4
Mahon, R. L., Elmhurst, Ill.	28	54
Malfatti, Guilherme, Sao Paulo, Brazil	2	2
Mann, Yooky, Hong Kong	4	6
Mansfield, Carl, Bloomingdale, Ohio	35	87
Manzer, Charles, New York, N. Y.	19	34
Manzer, Helen, New York, N. Y.	15	28
Marani, Davolio G., Modena, Italy	2	3
Marsh, Kenneth F., Detroit, Mich.	2	2
Marshall, Jos. W., Seattle, Wash.	4	6
Martin, Rosendo M., Barcelona, Spain	4	6
Martin, Sarah, Rockwood, Mich.	9	25
Massey, Harold C., Riverside, Calif.	5	9
McAlexander, Nina, Birmingham, Ala.	2	2
McBryer, Grace E., Philadelphia, Pa.	2	2
McClelland, R. T., Wilmette, Ill.	3	3
McKay, L., Brisbane, Queensland, Aus.	4	9
McKee, W. V., Pelham Manor, N. Y.	28	45
McMenemy, E. T., Santa Barbara, Cal.	2	5
McMillion, E. B., New York, N. Y.	2	2
McVie, J. A., Victoria, B. C., Canada	17	55

Name	Exh.	Prints
Medar, Ivan, Zagreb, Jugoslavia	3	4
Mehra, P. N., Allahabad, India	6	10
Mehta, N. V., Surat, India	11	22
Meister, Frank, Kansas City, Mo.	18	44
Mendes, Flinio S., S. Paulo, Brazil	2	3
Menendez, A., Havana, Cuba	2	3
Milgram, Jr., Jos. B., Brooklyn, N. Y.	2	2
Miller, Francis H., Baltimore, Md.	2	4
Miller, Lowell, Rochester, N. Y.	39	110
Miller, Paul B., South Bend, Ind.	14	26
Mitchell, Preston E., Whittier, Calif.	3	5
Moat, A. E., London, England	3	4
Mony, C. A. S., Madras, South India	6	10
Moore, D., New South Wales, Australia	2	5
Moore, Marian Grace, Cincinnati, Ohio	4	7
Morris, H. T., Lancaster, England	3	6
Mors, Barbara, S. Paulo, Brazil	2	4
Mottart, R., Braine-L'Alleud, Belgium	2	2
Mowat, Jean, Chicago, Ill.	4	6
Mukeyee, B. K., Calcutta, India	4	5
Muller, G., Grand Duchy of Luxembourg	5	10
Myers, Alfred H., Chicago, Ill.	2	4
Myers, Lida, Elma, Wash.	2	4
Naser, James H., Washington, Pa.	3	4
Naylor, H. Del, Chicago, Ill.	3	4
Newhall, E. G., Santa Barbara, Calif.	3	5
Noftsinger, Frank A., Roanoke, Va.	18	42
Nogueira, Silva, Lisbon, Portugal	7	15
Noma, Yoshio, Seattle, Wash.	14	20
Norris, Dorothy L., New York, N. Y.	7	7
North, Ernest Culver, Baltimore, Md.	5	8
Noulet, Louis, Paris, France	2	5
Nuti, Angelo F., Sao Paulo, Brazil	2	5
Nyns, Errol A., Calcutta, India	13	23
Obey, David, Jr., Bellevue, Ohio	3	8
Ochoa, Julio C., Montevideo, Uruguay	2	4
Ochotta, N., Edmonton, Alberta, Can.	10	12
Ochtman, L., Jr., Ridgewood, N. J.	6	10
Oehl, Art H., Winnetka, Ill.	27	42
Officica, J. F., Rio de Janeiro, Brazil	34	69
Omori, M., Fukuoka City, Japan	8	10
Ors, Francisco Sanchez, Alicante, Spain	2	3
Otero, Pedro, Buenos Aires, Argentina	2	3
Otsuka, Masatoki, Sao Paulo, Brazil	4	8
Owen, C. E. Wray, Victoria, Australia	2	2
Pagel, Victor, Milwaukee, Wis.	2	2
Palmerio, Fernando, Sao Paulo, Brazil	3	4
Panter, R. A., Toronto, Ont., Canada	13	29
Partington, N., Johannesburg, S. Africa	2	2
Patel, Kanti A., Bombay, India	14	27
Paz, Luis, Madrid, Spain	2	2
Pazovski, Kazik I., London, England	9	17
Pease, D. Ward, Winnetka, Ill.	25	49
Pedersen, Paul, AArhus, Denmark	4	6
Pekni, Attilio, Monza, Italy	3	4
Peretti-(Griva), Dr. Domenico Riccardo, Torino, Italy	11	21
Pershall, Major W. R., New York, N. Y.	3	4
Pesak, K. F., Praha, Czechoslovakia	2	2
Pessl, Frederick V., Glasgow, Scotland	2	3
Petersen, O., New Zealand	2	2
Phegley, M. M., Glendale, Calif.	2	4
Pilgrim, H. Francis, Chatham, England	2	2
Pinto, Mario, Lisbon, Portugal	6	8
Piper, Floyd G., Streator, Ill.	6	14
Polacow, Jacob, Sao Paulo, Brazil	2	3
Pollak, Karl, London, England	6	16
Pollard, Roy B., Seattle, Wash.	2	2
Porter, Elbert, San Francisco, Calif.	9	12
Prause, Alvin W., St. Louis, Mo.	2	4
Pratte, Dorothy, St. Louis, Mo.	2	5
Pratte, Paul K., St. Louis, Mo.	2	7
Prieto, Alvaro, La Habana, Cuba	3	3
Puggard, Louis A., Detroit, Mich.	22	52
Pun, Lin-Yu, Canton, China	4	8
Pun, Yet-Pore, Canton, China	8	17
Purdy, George W., Port Orchard, Wash.	3	4
Purrington, F. L., Wheaton, Ill.	2	2
Raikowski, Stanley, Seattle, Wash.	15	18
Ralston, Wallace, Dallas, Texas	9	16
Ranganathan, B., Madras, India	2	2
Ransdell, William E., Seattle, Wash.	2	6
Raphals, Victor, Chicago, Ill.	2	2
Rasmussen, V., Copenhagen, Denmark	2	2
Rastomjee, K. N., Poona, India	6	8
Reed, Lewis T., Chicago, Ill.	10	24
Reeves, J. G., Buenos Aires, Argentina	2	2
Regnier, R. C., Jr., Baltimore, Md.	2	3
Richards, Jr., South Bend, Ind.	16	33
Richardson, J. P., Cleveland, Ohio	5	9
Richter, Jr., G. A., Springfield, Pa.	2	3
Rieff, Jules, Bronx, N. Y.	2	4
Ring, Paul F., Richmond Heights, Mo.	3	3
Rodrigues, Nelson S., S. Paulo, Brazil	3	6
Roehm, Louis W., Seattle, Wash.	9	15
Romig, O. E., Pittsburgh, Pa.	36	94
Rosenbauer, Stefan, Rio, Brazil	2	7
Rossman, C. A., Philadelphia, Pa.	2	4
Roush, Edith E., Milwaukee, Wis.	2	2
Roussel, Pierre, Clichy, Seine, France	2	5
Row, S. V. Gopal, Madras, India	5	6
Ruchhoft, C. C., Cincinnati, Ohio	24	47
Rudnay, Julius, Jr., Overland, Mo.	2	3
Ryan, A. A., Hamilton, Ont., Canada	4	11
Saderman, A., Buenos Aires, Argentina	2	2
Sage, Thomas B., Dayton, Ohio	8	8
Sailors, H. R., Bartlesville, Okla.	3	3
Samuelson, Chas. T., Houston, Texas	2	5
Sarkany, Jeno, Sopron, Hungary	2	2
Sarkar, Dr. S. N., Calcutta, India	3	3
Sato, Wm. R., Seattle, Wash.	2	3
Saunders, L. G., Dr., Saskatoon, Canada	4	11
Schaepman, C. F. F., Zwolle, N'rlands	25	43
Schafer, E. F., Birmingham, Mich.	15	48
Schlesser, Albert, Luxembourg	8	13
Schmidt, H. J., Auckland, New Zealand	4	4
Schofield, J. V., Santa Barbara, Calif.	2	2
Scholten, J., Haarlem, Netherlands	2	2
Schuelke, T. H., Liverpool, N. Y.	21	38
Schuster, Ludwig, Munchen, Germany	17	38
Schwartz, Alfred C., Brooklyn, N. Y.	4	7
Schwartz, Martin, Seattle, Wash.	2	3
Seepel, Oscar, Mendoza, Argentina	2	6
Seidl, Joseph, Budapest, Hungary	20	31
Seim, George, Woodhaven, N. Y.	21	47
Seng-Aun, Tan, Penang, Malaya	2	2
Seth, Alden F., Broad Channel, N. Y.	5	10
Sharp, Al Bardeen, Brooklyn, N. Y.	3	4
Sharp, Frederick T., Springfield, Ill.	4	7
Sheriff, J., Norwalk, Conn.	2	2
Shiraishi, Carl K., New York, N. Y.	2	3
Sibley, Claud C., Hamden, Conn.	7	10
Sidaway, Roland, Egypt	2	3
Siebenaler, Robt., Luxembourg	7	9
Sigler, E. B., Rock Island, Ill.	13	26
Silberstein, B. G., Cincinnati, Ohio	5	8
Silverman, S., San Francisco, Calif.	10	25
Simonetti, D. A., Jersey City, N. J.	11	22
Sims, Clarence F., Toronto, Canada	2	4
Sipes, J. T., Detroit, Mich.	3	8
Sit, Tsae-Kong, Canton, China	8	18
Skita, Victor, Budapest, Hungary	13	25
Small, Dr. Wm. F., Newburgh, N. Y.	17	30
Smethurst, A. F., So. Orange, N. J.	10	20
Smith, C. C., Hamilton, New Zealand	3	3
Smith, O. W. R., Toronto, Canada	8	16
Smith, R. J., San Diego, Calif.	2	4
Sobrino, Francisco, Mexico City, Mexico	3	7
Sohl, Stanley D., Lincoln, Nebr.	6	7
Solomon, Phillip, Hartford, Conn.	6	12
Sorensen, Max W., Fresno, Calif.	5	7
Soubes, H. G., Montevideo, Uruguay	2	3
Spaven, Lawrence M., Rochester, N. Y.	27	72
Sperling, Alan H., Pittsburgh, Pa.	3	5
Spicer, Wm. J., Cincinnati, Ohio	12	24
Springthorpe, John, Mt. Airy, N. C.	17	28
Stanbaugh, Glen H., Houston, Texas	3	5
Standish, L. Whitney, Boston, Mass.	2	7
Stanley, David M., Buffalo, N. Y.	2	4
Steffen, Carl, Chicago, Ill.	5	10
Stephens, Walter H., Los Angeles, Calif.	2	2
Stewart, Dan, Fresno, Calif.	16	33
Stoll, Phyllis Moore, New Orleans, La.	5	11
Stolp, Jack, Charlotte, N. C.	6	10
Straus, Morton, New York, N. Y.	2	3
Sturdevant, Dr. L. B., Seattle, Wash.	3	3
Sulke, Rudolf Dr., Vienna, Austria	15	28
Suydam, W. Starr, Madison, N. J.	14	27
Syed, Asad K., Palanpur, India	2	2
Szolloxy, Kalman, Budapest, Hungary	8	12
Taborda, F. D. S., Lisbon, Portugal	5	7
Tachikawa, Heihachi, Hokkaido, Japan	2	2
Tannehill, N. A., Houston, Pa.	2	3
Tattersfield, Gerald, Philadelphia, Pa.	25	52
Taylor, C. P., Towson, Md.	4	8
Taylor, Thelma, Franklin Park, Ill.,	3	4
Taylor, Warner, Madison, Wis.	5	7
Thomas, Dr. G., Bangalore, India	17	29
Thompson, Miss E. P., Dublin, Ireland	3	4
Thompson, James F., Cincinnati, Ohio	34	68
Thorek, Dr. Max, Chicago, Ill.	34	61
Thornton, H. R., Birmingham, England	34	82
Tidridge, Lionel J., Windsor, Canada	8	24
Tilden, Merrill W., Chicago, Ill.	26	45
Tipple, Chas. H., Oneonta, N. Y.	9	18
To, Dr. Ernest, Hongkong	4	9
Toll, Grant, Windsor, Canada	4	9
Tollinger, R. J., Pleasant Hill, Ohio	19	30
Tollinger, Mrs. T., Pleasant Hill, Ohio	18	34
Tompkins, C. Stuart, Victoria, Australia	2	3
Torer, E. G., Oshawa, Ont., Canada	4	4
Trevellin, Sergio, Sao Paulo, Brazil	2	2
Trovato, Alfio, Sao Paulo, Brazil	2	2
Tsoi, Chun-Sam, Canton, China	5	10
Turner, Dr. Carrol, Memphis, Tenn.	26	45
Uchimura, Koichi, Hanamaki, Iwateken, Japan	11	17
Ulmer, Dr. D. H. Bartine, Monrestown, N. J.	4	9
Underwood, A. M., Rochester, N. Y.	5	20
Vacari, Luis, Sao Paulo, Brazil	4	6
Vadas, Erno, Budapest, Hungary	12	32
VandeWijer, Sao Paulo, Brazil	2	2
Vandewyer, Dr. M., Antwerp, Belgium	9	14
van Loenhoud, B. C., Rotterdam, Hol.	5	7
Veblen, Mrs. Marina, Delmar, Calif.	2	6
Vence, Vincent C., Allendale, N. J.	4	8
Vial, A. E. Lockington, Leicester, Eng.	6	11
Vicente, Fernando, Lisbon, Portugal	2	2
Victor, Antonio Da Silva, S. Paulo, Brazil	2	3
Violett, CDR. Quentell, Norfolk, Va.	16	29
Vivier, Claude, Roubaix, France	6	7
Waddell, K. P., Rio, Brazil	2	2
Waddle, Harry, Port Dover, Canada	50	141
Wagner, H. W., Worcester, Mass.	32	71
Wahlman, J. Phil, Chicago, Ill.	3	4
Walburn, A. W., Devon, England	3	4
Wallace, W. Murray, Toronto, Canada	3	4
Warne, Robt. L., Brooklyn, N. Y.	5	7
Warren, M. E., Annapolis, Md.	2	4
Waters, Lily, New York, N. Y.	2	5
Watkins, J. M., Chicago, Ill.	2	3
Watson, Alfred, Buffalo, N. Y.	41	84
Webb, Edmund J., Chicago, Ill.	3	6
Webb, Rand, Beaver Falls, Pa.	4	7
Weber, Doris M., Cleveland, Ohio	49	136
Weber, Jos A., Philadelphia, Pa.	3	5
Weed, C. Bronson, Hamden, Conn.	10	18
Weierich, E. M., Moline, Ill.	5	11
Weiss, J. A., Jasper, Alberta, Canada	3	3
Weissenburger, G. L., Keokuk, Iowa	45	106
Werner, Luthy, Berne, Switzerland	7	11
West, Colin, G., Adelaide, Australia	2	2
Westlake, F. Eliot, Cincinnati, Ohio	22	37
Wetmore, E. G. L., Halifax, N. S., Can.	2	2
Whitcomb, Edwin B., Aiton, Ill.	8	10
Whitehouse, T. V., San Diego, Calif.	4	7
Whitnell, Wood, New Orleans, La.	6	8
Wicking, T. A., Victoria, Australia	2	3
Wier, Wilber H., San Diego, Calif.	23	53
Williams, David H., Owego, N. Y.	3	3
Williams, L. R., Victoria, Australia	2	4
Wilson, Charles L., San Diego, Calif.	28	73
Windstosser, Ludwig, Stuttgart, Germany	2	4
Wingquist, R., Stockholm, Sweden	5	12
Winnik, Martin J., New York, N. Y.	24	43
Wippert, Gretchen M., El Monte, Calif.	3	9
Wise, Arnold, Albany, N. Y.	3	6
Wolf, Howard A., Chicago, Ill.	2	5
Wolf, Reinhart, Crawfordsville, Ind.	2	2
Wolfe, Paul J., Butler, Pa.	11	22
Wong, C. B., Vancouver, B. C., Canada	2	3
Wong, Wing-Cheung, Canton, China	9	19
Wong, Yung-Kwong, Canton, China	8	13
Wood, W. F., Montreal Quebec, Can.	15	23
Woods, John W., Convent, N. J.	2	2
Wooley, Jr., A. E., Baton Rouge, La.	11	16
Wooton, H. W., Long Eaton, England	4	4
Worth, Edith, Nutley, New Jersey	3	4
Wray, J. L. Beecroft, N.S.W., Australia	2	4
Wright, Claude H., Toronto, Canada	3	4
Wright, C. W., Buffalo, N. Y.	6	13
Wright, Jack, San Jose, Calif.	44	112
Wright, S. P., Springfield, Ill.	12	20
Wu, Francis, Hong Kong	19	45
Wy, Esther C., Washington, D. C.	2	2
Yakovenko, Ivan, Hobart, Tasmania	7	13
Yakovlev, Yasha, New York, N. Y.	3	6
Yarovoff, Nicolas, Montevideo, Uruguay	4	4
Yarrington, C. A., New York, N. Y.	26	45
Yau, Young Wing, Hong Kong	3	4
Yoshida, Roberto H., Sao Paulo, Brazil	4	4
Young, Tse-Yee, Shanghai, China	4	4
Zacher, Robt. D., St. Louis, Mo.	3	4
Zapa, H. F., Buenos Aires, Argentina	2	4
Zapiola, H. Q., Buenos Aires, Argentina	2	3
Ziegler, P. J., Akron, Ohio	2	6

THIRD ROSE EXHIBITION

Entries for the Third International Rose Color Slide Exhibition, sponsored by the Reading Rose Society and the Berks Camera Club, will close on January 23, 1952. Entry forms may be obtained from PSAer Blair M. Sleppy, Chairman, Berks Camera Club, 550 North 11th St., Reading, Penna.

PSA TRADING POST

Open to individual members, free of charge. Limit 25 words each. Copy closes the tenth of the second preceding month before publication.

For Sale—4 x 5 Synchro Graflex f/4.7 Dogmar, new curtain, 2 septums, PC Zeiss Ikon 7½" tessar compur, Anuco reflex with filter kit. 2D 5 x 7 Eastman view. Best offer. Charles H. Tipple, Bresee's Department Store, Inc., 155–165 Main Street, Oneonta, New York.

For Sale—Graflex 3¼x4¼ magazines cut film or plates at $10 each. Goertz Berlin Dagor 10cm in compur, $35; Angulon 90mm f/6.8 in synchro-prontor, $35. Esther C. Wy, 136 Sheridan St. N.E., Washington 11, D. C.

For Sale—Heidoscop 6x13 stereo, 120 roll-holder, plate magazines, 6 holders, FPA, 2 sets Zeiss Proxars, f/4.5 Tessars, case, $150. Norman Rothschild, 84 Bay 25th St., Brooklyn 14, New York.

Stuyvesant Peabody Award

In the granting of the Stuyvesant Peabody Award for 1951 to Harry K. Shigeta, Hon. FPSA, recognition is given to a man whose unique contributions to the interests of pictorial photography and photographers has meant a sacrifice of personal time, effort and health. His has been a thankless task in repeatedly serving as judge for important exhibitions as well as selecting and criticizing annual shows, monthly contests and rendering invaluable services to individuals whenever asked. He has served this Society with tireless energy through his articles and constructive print criticisms.

Without gain, except that of personal satisfaction, he has never hesitated to give of himself untiringly for the benefit of individuals and clubs. Through his writings he has passed on to those in need his vast knowledge of art and photography, gained through a lifetime of experimentation and experience.

Because of the fine work he has done, and for which we have benefited as a group, our beloved Harry Shigeta has been selected to receive the Stuyvesant Peabody Award for 1951.

ROBERT L. MCFERRAN, APSA, *Chairman*
Stuyvesant Peabody Award Committee

PSA Christmas Gifts

In the October JOURNAL on page (2)49, announcement was made of the availability of two gifts for photographers—membership in PSA with a suitable gift certificate and lovely personalized ties.

The ties may be obtained from Headquarters at $5.00 each postpaid in rayon crepe or nylon in maroon, bright red, Navy, medium blue, dark green, brown and grey. Be sure to specify the type of lettering (script or block), copy and if a sketch is wanted, include a rough one for artist's guidance. See October article for full details.

Progress Medal to Goddard

Colonel George W. Goddard, a pioneer in modern aerial photography, was awarded the 1951 PSA Progress Medal October 10 in ceremonies at the Detroit Institute of Arts.

Colonel Goddard, who since 1945 has been chief of the photographic laboratory of the engineering division at Wright Field Air Force Base, Dayton, Ohio, received the medal for his unique and outstanding contributions to the progress of aerial photography.

A major portion of Goddard's military career has been devoted to experimental work in aerial photography. He pioneered the development of rapid processing of photo films and prints in airplanes during flight, wire transmission of military air photographs, and simplified developing and printing equipment.

He is credited with invention of special shutter and flash synchronization equipment for aerial cameras used in making the world's first night aerial photographs.

Colonel Goddard was born in Tunbridge Wells, England, and came to the United States during his childhood.

In 1917 he enlisted as a private in the aviation section of the Army Signal Corps and was graduated the following year from the first officers' school in aerial photography at Cornell University. He received his commission as a lieutenant in the Air Corps in August 1918.

Following pilot training he was assigned to McCook Field, Nebraska, as officer in charge of aerial photographic research. During this assignment he began development of infrared long-range photography, special aerial cameras, photographic airplanes, and portable equipment.

In 1920 he was transferred to Washington, D. C., in charge of aerial protography in the Office of the Chief of Air Corps. He later returned to McCook Field where he spent several years directing research on aerial photography.

During World War II Colonel Goddard served in the European Theater.

Exhibition Listing

Thirteen open photographic exhibitions have been held and have published catalogues so far in the 1951–52 exhibition year, which began July 1, 1951. They are: Port Talbot, South Shields, Memphis, Hartford, Edmonton, Edinburgh, Denmark, Falmouth, Calgary, Springfield, Ill., Lea Valley, Barcelona and Lucknow. Barcelona and Lucknow were last year exhibitions which did not publish catalogues in time to be included in the *American Annual* listing and are therefore included in this list as they will appear as '51–'52 shows. Midland, England, is not included as they prejudiced themselves against pictures with previous successes and did not hang 125 prints out of over 1,000 entered.

The following exhibitors have had 10 or more prints accepted this year.

Name	*Country*	*Exhib.*	*Prints*
Harry L. Waddle	Canada	13	41
Jack Wright	USA	13	38
Frank J. Heller	USA	13	32
Lowell Miller	USA	8	26
Eugenia Buxton	USA	10	26
Juris Benjamin	England	9	25
Jose Oiticica	Brazil	10	23
Francis C. K. Wu	Hongkong	10	23
Carl Mansfield	USA	8	19
Doris M. Weber	USA	7	18
Theodore Bronson	USA	8	18
Axel Bahnsen	USA	7	17
J. W. Galloway	Canada	8	17
Alfred Watson	USA	9	17
John I. Fish	USA	7	16
Max Thorek	USA	8	16
Wellington Lee	USA	5	14
H. Roy Thornton	England	7	14
E. Lockington-Vial	England	5	13
H. W. Wagner	USA	5	13
G. L. Weissenburger	USA	5	12
Merrill Tilden	USA	7	12
J. Edwood Armstrong	USA	3	11
George Hughes	Scotland	4	11
James A. McVie	Canada	4	11
Wilbur Wier	USA	4	11
Boris Dubin	USA	5	11
O. E. Remig	USA	5	11
Victor Skita	Hungary	5	11
William Spicer	USA	5	11
Jose Ortiz Echague	Spain	4	10
Rene Jentgen	Luxembourg	4	10
Irma Haselwood	USA	5	10
Charles Wilson	USA	5	10
Jean Biennime	France	6	10
Boydon Hindman	USA	8	10

Please realize that there is considerable delay between the time this list is compiled and the time it is published so that each individual will know of more personal acceptances than will appear in the list.

Statement of the ownership, management, and circulation required by the Act of Congress of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233) of PSA JOURNAL published monthly at Albany, N. Y., for September, 1951.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Photographic Society of America, Inc., 2005 Walnut St., Philadelphia 3, Pa.; Editor, Fred Quellmalz, Jr., Kutztown, Penna.; Managing editor, None; Business manager, Fred Quellmalz, Jr., Kutztown, Penna.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.) Photographic Society of America, 2005 Walnut St., Philadelphia 3, Pa.; John G. Mulder, President, Kodak Park, Rochester 4, N. Y.; Sewell P. Wright, Secretary, Linden Lane, Route 3, Springfield, Ill.; Charles Heller, Treasurer, 1115 N. 65th St., Philadelphia 31, Pa.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required from daily, weekly, semiweekly, and triweekly newspapers only.)

FRED QUELLMALZ, JR.
(Signature of editor)

Sworn to and subscribed before me this 28th day of September, 1951.

H. H. LIPPINCOTT, Notary Public
23 S. 23rd St., Philadelphia, Penna.
(My commission expires January 25, 1955)

Pictorial DIGEST Division

Devoted to News of the Pictorial Division of the Photographic Society of America

Volume 4
Number 11

An International Introduction

When we announced the appointment of Colonel Charles J. ("Joe") Perry as Director of the International Portfolios last month, we promised you a short hypo-history of him this month. Many of you met Colonel Perry in Detroit, but since this went to press before the Convention, we wrote and asked him to give us about 200 words about himself as an introduction. His reply describes himself and his photographic philosophy:

"Your idea of cooking up a 200 word 'hypo history' on my photographic activities is a mighty laudable one, but your arithmetic is just a wee bit ambitious. Just lop those two ciphers off the 200 and I can meet your desires to a 'T'—my photographic history fits nicely into *two* words —'Ain't None.'

"I am merely an old soldier whose ego got deflated when he learned that the Army could get along without him, but who is looking for a busy corner to fade away in. I was born in Massachusetts and after 32 years of wandering, wound up in Texas where my military career started, and here I am, probably the only Texan who does NOT own an oil well, does NOT ride the range with the Lone Ranger, and does NOT own a brace of fast shooting hand guns.

"During the recent unpleasantness with Mr. Hitler et al., I 'liberated' a camera and I've been getting into folks' hair ever since trying to find out how the durned thing works. When I came back from Europe a couple of years ago, I wandered into PSA and into one of Eldie Christhilf's Pictorial Portfolios. Although I found myself in mighty fast company, I learned to my amazement that without exception every member of the Pictorial Division I have come into contact with is ready, willing and anxious to give freely of his time, experience and know-how in a concerted effort to bring the confused beginner up to a degree of proficiency where he can compete with the very best in the international exhibitions.

"You know, after a reasonably well-rounded life bumping around this earth in a world of dog-eat-dog and observing on every hand the good old-fashioned cut-throat competition, an organization of nice people that didn't have a price tag on every smile just didn't make sense—it was almost too good to be true, particularly to a GI with the dust of Dachau and some of the other Nazi chambers of horror still on his shoes.

"And to prove my point, I hied myself to the St. Louis Convention just to learn what sort of bokum they fed these birds to get this brotherly love attitude into print. Again I was amazed to learn that it is really *true*—the truly great in modern photography were not aloof and untouchable, on the contrary, that smile was genuine and that handclasp was sincere.

"No one said, 'Who are you and where do you come from?' Instead it was, 'I haven't seen your name in the catalogs, Joe. How come? You must be having some difficulties or you would be up there. What can I do to help you make the grade?' That, friends, is democracy at work and anyone who hasn't found out about it yet is the fellow that hasn't been given the opportunity to get in on a PSA membership!

"Such an organization is not only something I want a part of, it is something I want to *be* a part of, and an organization that I want to help with every bit of my best efforts, feeble though they may be. I only hope I can repay in kind some of the warm friendliness I have found in every corner of PSA."

That is his hypo-history. And all we can add to this statement of belief in PSA and the Pictorial Division is our own opinion that any Director who believes in the powers of friendly assistance through his activity is bound to find only the same friendly attitude in everyone with whom he comes in contact. We know the International Portfolios will succeed under such direction—they could not do otherwise.

If you are interested in broadening your photographic horizons through membership in an International Portfolio, write him further concerning the portfolios which are accepting members. His address is in the masthead on the first page of the *Digest*.

International Bouquets

Mrs. Andre Robinson, former general secretary of the French-American Portfolios, had to give up her secretaryship when she moved to a small mining town in Arizona, one of the few towns having express difficulties. All of the members ap-

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29 Spring Street, Brockport, New York

preciate her valuable contribution to this portfolio through her service in translating the comments and the Notebook entries, and keeping the portfolios moving.

Our sincere appreciation is also extended to Dr. William F. Small, former Associate Editor of the International Portfolios section, who had to relinquish his duties due to poor health. We are glad to report, however, that he is steadily improving.

MISS EVELYN M. ROBBINS, *Associate Editor*

Despite the fact that many readers presumably are in a portfolio, or perhaps several portfolios, the real importance of making truly good pictures may not have come home to all of you.

Not long ago I had the pleasure of seeing a portfolioist hang his first picture in an international salon. I am sure he won't object to my using his name, so instead of being mysterious about it, I am going to use actual names and places.

The man in question is V. E. Shimanski, of La Crosse, Wisconsin. The salon was the Fourth International Exhibition of Photography sponsored by the Illinois State Fair, and the judging was held in Springfield August 4th and 5th. Mr. Shimanski—better known as "Shimmy"—drove all the way from La Crosse to Springfield to attend the judging.

Having decided to make the trip, Shimmy sent prints to the show. It was the first international he had ever seen judged, and the first show to which he had ever sent prints.

Now, Shimmy has a good background in photography, and has belonged to several portfolios for a number of years, so he isn't exactly a tyro. He has been working hard in the portfolios, trying to improve his prints, both technically and pictorially, but he told me not once but several times that not until he knew that his prints were going up on the easel before an international salon jury did he realize how important good print-making could be.

"It was a fearful experience," he said. "It is something you sweat out; I don't mind admitting that I really was tied up in knots when I saw my prints going on the easel, and while I waited for the judges to make their decision."

As I have already said, Shimmy hung one of his prints. Considering the fact that 1428 prints were submitted, and only 300 were hung, this could certainly be considered a tough show, and Shimmy is certainly to be congratulated upon his achievement—and, fortunately, an achievement which entitles him to the Portfolio Medal, for his print, "Skidrow," was one which had traveled in Portfolio No. 66.

The point I want to make is that entering salon competition is a relatively good thing if for no other reason than its effect upon the quality of one's work.

All of us, who can remember the first time we saw one of our prints before an international exhibition jury, understand exactly how Shimmy felt when his print was placed on the easel in Springfield. After a time, of course, we become somewhat case-hardened, but hardly unconcerned when our prints hit the easel or light box. We may be able to pretend that we are completely indifferent, but it remains true that the print being judged is our baby, and the decision of the jury is important to us.

From my own personal experience, and from the experience of my friends, I can say that participation in the Pictorial Portfolios is only a *first* step toward greater photographic stature. The *second* step is participation in a higher level of competition: the international exhibitions.

You know how anxious you are to tear open the portfolio when it reaches you, and see what your fellow portfolioists, and your commentator have said about your work. When you send prints to an international salon you are, in effect, asking for a higher and still more critical opinion regarding the value of your work.

Don't get the idea that the salons are just for the big names in photography; that definitely is not true. The salons are always eager to have the work of newcomers, with fresh ideas and fresh approaches, and participation in the Pictorial Portfolios should prepare any reasonably intelligent person for serious participation in salon competition within a relatively short time.

Too many think that the ways and means of entering a salon are such common knowledge that no one thinks to tell the beginner just how one goes about salon competition, so I am going to give you some simple instructions here and now.

You will find forthcoming salons listed in the JOURNAL, and in most of the other photographic magazines. Your first step is to write for an entry blank, addressing the person whose name is given in each of the magazine notices. A postcard will do just as well as a letter.

When you receive the entry blank, it will just about explain itself, except for one little detail: After the title of each print, there is usually a space for "process." Chances are that you will be submitting a straight photographic print—not dye transfer or paper negatives or mediobromes or multiple gums—and if your prints are just straight prints, then the initials CB (standing for chlorobromide) should appear in this space.

The entry blank should be filled in and mailed to the indicated address, together with the entry fee, which is usually $1.00 or $2.00 for any number of prints up to four, which is the maximum. Note that not infrequently the entry blank is sent to one address and the prints themselves to another.

The prints should be carefully packed to avoid damage, and sent in plenty of time to reach the salon before the closing date, which will be given on the entry blank. The title of the picture should appear in *small* script immediately below the print at the left, and your name immediately below the print at the right. On the back of each mount should appear the number of the print (each print will be numbered 1, 2, 3, or 4, to correspond with the order in which they were listed on the entry blank) and below the number, on the back of the mount, should appear the title, followed by your name and address.

Almost all entry blanks include a shipping label to be used on the package of prints, which should be sent either by parcel post or by prepaid express.

Shortly after the judging date, you will receive a postcard which will give you the number of prints which have been accepted for hanging, or the sad news that none have been accepted. Since the report card will give you only the numbers of the prints, be sure to keep a record when you send out the prints, so you will know which print was number 1, which was number 2, etc.

Ordinarily, if all four prints are rejected, they are returned immediately. If one or more prints are accepted, they will all be returned at the same time, after the show has been taken down, and the prints will be returned to you by prepaid parcel post—or by express collect, if you ask that they be so returned.

If you prefer, you may have Show Number 1 ship your prints directly to Show Number 2, if the "all-prints-returned-by" date of Show Number 1 is at least a couple of weeks in advance of the closing date of Show Number 2. If you do this be sure that you get an entry blank from Show Number 2, and get it and your remittance to Show Number 2 before the closing date.

It sounds a little complicated, but actually it is a very simple procedure. You will probably start out with only one or two sets of prints, but after the salon bug really bites you will have six or eight or a dozen or even more sets of prints out.

AN INVITATION

This is an invitation to every PSA member to participate in the PSA American Portfolios.

Enrollments are now being received in the following specialized groups:

PSA Pictorial Portfolios
PSA Portrait Portfolios
PSA Miniature Portfolios
PSA Control Process Portfolios
PSA Star Exhibitor Portfolios
(For PSA Award of Merit Winners)
PSA Nature Portfolios
PSA Photo-Journalism Portfolios

For information concerning any of the foregoing activities and for enrollment blanks, write to the Director of the PSA American Portfolios, Eldridge R. Christhilf, Hon. PSA, APSA, Suite 406, 800 Davis Street, Evanston, Illinois.

*"Star Dust"**

ROY E. LINDAHL, *Gen. Sec'y*
PSA Star Exhibitor Portfolios

The following letter by John R. Hogan, Hon. PSA, FPSA, has been instrumental in starting a discussion which our readers may find to be interesting:

"For some time I have been playing with the idea of getting a 4 x 5 camera to make some really sharp pictures which I like, and I have seen some made with cameras of this size that are sharper than I am able to get with my Rollieflex.

"When I look over the prints in this portfolio I wonder whether I am on the right track. I have read somewhere that in order of sharpness cameras can be rated as follows:

Box Cameras
Folding Cameras
Twin-lens reflex cameras
View-type cameras or Speed Graphic Type

"When I look at the prints in the portfolio I find:

2 x 2¼	Super Ikonta	Fairly sharp
2¼ x 2¼	Super Ikonta	Fairly sharp
2¼ x 2¼	Rollieflex	Fairly sharp
		Fairly sharp
		Fairly sharp
2¼ x 3¼	Makina	Fairly sharp
		Not quite sharp
		Not quite sharp
		Not quite sharp
2¼ x 3¼	Folding Kodak	Fairly sharp
		Fuzzy
2¼ x 3¼	Medalist	Fairly sharp
		Fuzzy
3¼ x 4¼	Voigtlander	Fairly sharp
3¼ x 4¼	Graflex	Fairly sharp
		Fuzzy
3¼ x 4¼	Press	Fairly sharp
4 x 5	Graflex	Fuzzy
		Fairly sharp
4 x 5	Speed Graphic	Fuzzy
		Fuzzy
		Fairly sharp
4 x 5	Press	Fuzzy
4 x 5	View	Soft
5 x 7	View	Soft
		Soft
		Fairly sharp
		Sharp

"The small size cameras up to 2¼ x3¼ have most of the fairly sharp pictures, the 4 x 5 cameras have most of the fuzzy prints, so why do people use them? There are no razor-sharp prints in the portfolio, probably because the subject matter does not call for it, but if I want to make a really sharp picture, how do I go about it? I know I can't get one with the Rollieflex and yet this seems to give sharper pictures in this portfolio than the larger sizes. What is the answer? Do any of you know exactly how to get a sharp print, and I mean *really sharp*, because I want to make some."

If you are a commentator you may be interested in an incident that came to my attention the other day. An acquaintance, who is a promising young photographer with an intelligent approach to his hobby, had recently been induced after considerable persuasion to invest in a PSA membership, Pictorial Division affiliation and a Pictorial Portfolio, on the basis that it would assist him greatly in his striving to produce better pictures.

Came the long awaited day when the portfolio was to arrive for its first visit, met with a high degree of expectancy and anticipation—the precise moment when *first* and lasting impressions are made and enthusiasm runs rampant. First there's the notebook for the new member to read so he can get acquainted with the rest of the members, then there's the prints—"Boy, are they swell, Dr. so and so really has a dandy, wonder how he made it—why here is a contact print and he hardly cropped it at all—got his composition just right in the first place so they say in the comments. Here's another, Miss so and so really got a nice brown tone on this one, etc., etc." You know the story and have had the experience.

Now comes the new member's print, just a grab shot of a little fellow that several of the members thought was pretty good but instead of telling him *what* was good or bad about the picture, *how* to remedy it by cropping, paper selection, toning, etc., and *why* these corrective measures would improve it, the commentator writes, "This picture doesn't belong in a Pictorial Portfolio, it's just a snapshot and not a very good one at that." The commentary continued with diverse and sundry remarks about the geographical location of the new member's home which were entirely irrelevant and inconsequential and, with all due respect and apology to this particular commentator (undoubtedly, we have all been a partner at some time or other) and with full consideration of the complexity of circumstances that might have prompted such commentary, I wonder if we are cognizant of the importance of these *first* impressions.

Shouldn't we share in a mutual obligation to reasonably analyze to the best of our ability any print that has been produced by anyone to the best of his ability? To tell a worker what, how and why leaves a far more lasting impression and a sense of value received for his expenditure of time, effort and money. This coupled with encouragement—be it ever so little, helps take the edge off the sharpest criticism.

Comments of a Commentator

PAUL K. PRATTE, FPSA, FRPS
Commentator, Portfolio #38

Some months ago my comments to the members of my portfolio were reprinted in this column. At that time I mentioned giving more thought to the making of the negative—in fact, giving more thought to the picture before the shutter is clicked. Unfortunately, this is only part of the story. Too many budding pictorialists seem to think that if they can make a good journeyman print from a sharp negative the result will be pictorial. This is far from being the case. The making of a good pictorial picture requires considerable thought along many lines and if only some "pictorial" thinking is put into the making of these pictures, the member will derive more benefit from his association with the other photographers in his portfolio and the commentator will not feel that his criticisms are falling on deaf ears. Just what kind of thinking should go on before one goes into the darkroom to print that picture? Let's list some of the questions which must be answered:

1) What kind of paper best suits the subject?
2) What size paper should be used?
3) What is the best composition—should the picture be cropped or not?
4) What is the proper format—horizontal, vertical, square or panel?
5) What paper developer would be most suitable—soft-working or contrasty?
6) Should there be any printing in or holding back on any part of the print during enlarging?
7) Should the picture be toned or left black and white?
8) Was the negative normal or should it have been intensified or reduced?

Of course, some photographers can just look at a negative and answer these questions, but the great majority, of which I happen to be one, cannot. The easiest solution to the problem is to make a proof print of every negative that is developed. This can be either a contact print or an enlargement. It can also be any size, although I prefer 4 x 5 prints which can be filed very nicely in 4 x 5 business filing boxes made of cardboard. These proof prints should be printed as is, without dodging or cropping, and include the entire negative if possible.

Now let us study these proofs. We can start thinking about the particular points mentioned above at once. When we come to composition a pair of cropping L's can be used to determine the best composition. Lay the cropping L's (which can be two L-shaped pieces of cardboard slightly larger than the print) on the picture and by moving them around determine how the scene looks best. Then take a pencil and outline a border around the inside of the L's directly on the face of the print. This will now fix the format which will later be composed on the enlarging easel. On the back of the same print write down all the ideas on paper selection, developer, tone, dodging, etc. Do this with every print which appears to have merit. In this way all of the thinking has been recorded on the proof print itself and even though it may be days, weeks or months before the final print is made none of the original ideas will be lost. At the same time the negative is not being damaged by repeated handling and the picture itself can be reproduced again and again by referring to the same data on the back of the proof print.

Earlier, I had recommended making a proof print of every negative. This is useful even for the worst negative because it gives the photographer an opportunity to study the scene. Perhaps the lighting was wrong and going back to the same place under proper conditions may result in getting the picture that was missed in the first instance. This information can be noted on the back of these prints which should be filed separately for redoing at a later date.

Pictorial photography is a definite means of self-expression and if members of pic-

* A monthly column devoted to the "Wit and Wisdom" of the Stars as taken from the Notebooks in the Star Exhibitor Portfolios.

torial portfolios will only make it a practice to consider how that final print should look before it is printed, it will not be too long before they can take pride in creating a picture which has some of their own personality in it, and which yesterday might have been just another record shot. So let's put on our thinking caps and get to work.

HIGHLIGHTS FROM
Portrait Portfolios

PAUL J. WOLFE, *Associate Editor*

Welcome to Bill Peak as commentator for No. 4. We would like to call attention to a movie filmed and produced by Bill titled "Studio." In this film the process of making a portrait from the appointment, lighting the sitting, developing the negative, and making prints for delivery is presented. It's a film that any camera club would enjoy and we feel that Bill would gladly loan it for showing at any club meeting. Write Mr. William A. Peak, Halcomb Studio, Galesburg, Ill.

On the photography of men, Bill Peak writes: "In making portraits of men it is better to make them in a low key, printed stronger, and a dark ground preferable. Panchromatic film is not the best medium to use for men. Orthochromatic gives better skin rendition and brings out the character to a higher degree. Diffuse lights with tracing cloth and do not over-expose the film."

C. Verne Klintworth, Master Photographer, of Tampa, Florida has taken over the commenting task for Portrait Portfolio No. 8. Verne has been president of the Florida Photographers' Association and at one time won a state tournament for pistol shooting. He is now a dyed-in-the-wool Florida cracker.

In Verne's commenting we find some very good rules: "Have your model look at something several feet back of the camera rather than into the lens. This is always a good rule unless your subject is at least eight feet from the lens."

Mr. Klintworth offers this excellent suggestion for altering or changing disturbing background: "Make a print on a double weight *soft* paper, a paper with a surface that will take oil color. Make this print rich in detail in both shadows and highlights—no blacks and no pure whites. Go over your whole print first with a colorists medium, well rubbed down, and it will provide a nice tooth for spotting with a pencil. Then with some neutral and white oil color, I would paint in a new background using a brush and/or the tip of the finger. Now, you have an opportunity to make corrections, such as lowering shoulder lines, removing chairs, etc.

"When you get the print and the background worked up to your satisfaction, make a copy negative (I make them successfully on Portrait Pan and Super Panchro Press and Commercial) but do not over-expose. You may do a little retouching on the negative, and accent some of the highlights."

Following the suggestion made by Maurice H. Louis, the editor of our *"Portrait Pointers"* publication, and several other members, we are entering folders in the portfolios for Remade Prints. It is suggested that members who want more criticism and who are anxious to improve their portraits remake a print following the instructions of their commentator and co-members. Insert this print in the Remade Prints folder for further comment and suggestions. This is a sure-fire method of doing better work.

There is plenty of room for additional members in our Portrait Portfolios. Simply write the director for a Technical Data Sheet to send in with your portrait. There is a service charge of only a dollar a year. For it you get a grand association with others interested in making better portraits and a subscription to *"Portrait Pointers,"* a quarterly publication worth twice the service charge.

News of the Pictorial Division

GEORGE GREEN, *Associate Editor*

New 1-Star Exhibitors

Anders Aalborg	Memphis, Tenn.
Rhyna Goldsmith	New York, N. Y.

PSA International Portfolios

There are openings in the following PSA International Portfolios for Pictorial Division members who are interested in interchanging prints for comment and analysis with the leading photographers in foreign countries:

Anglo-American
Canadian-American
India-American
Australasian-American
Cuban-American
French-American
Swedish-American
South African-American
Brazilian-American
Belgian-American
Chinese-American
Netherlands-American
Dominican-American
International Medical Portfolios
Costa Rican-American
Carribbean-American
Mexican-American
International Control Process Portfolios

For information, write to the Director of PSA International Portfolios, Miss Jane J. Shaffer, 5466 Clemens, St. Louis, Missouri.

Advanced from 1-Star to 2-Star

J. Wallace Galloway	Edmonton, Canada
Edythe Biggs	Alton, Ill.
Norman Partington	Durban, S. A.

Advanced from 2-Star to 3-Star

Paul J. Wolfe	Butler, Penn.

Advanced from 3-Star to 4-Star

Frank J. Heller, APSA Bartlesville, Okla.

Do you make consistently good prints? Are they bringing you acclaim and awards in club competitions and salons? Are you proud of your achievement? If your answer is "Yes" then why aren't you a Star Exhibitor? Your name will appear in the Pictorial *Digest* and PSAers will recognize your talent when you wear the lapel pin denoting your class of Star Exhibitor.

Write to the director of the Award of Merit, whose address is in the masthead on the first page of this section for more information.

Service Helping Pictorialists

There has been a growing increase in the number of serious members of the Pictorial Division who have taken advantage of the Personalized Print Analysis Service.

This increase undoubtedly may be attributed to the factor that every human being, after sloughing along in the trough of mediocrity, suddenly realizes that for the same effort and time he could be producing prints stamped with his individuality.

It is a realization that comes overnight and then takes many months for fulfillment. The period depends entirely upon the advice and constructive criticism received. Unfortunately, non-members of the Pictorial Division must flounder around because they do not have the Personalized Print Analysis Service.

Prints have been submitted from various states and countries throughout the world. A recapitulation of these prints show that the problems of the pictorialists are very much the same. It is apparent that the commonest fault is that insufficient thought has been given to the material and the ingredients which go into making a good photograph. These can be summarized as follows:

1. A deficiency of pictorial interest and appeal in the subject matter.

2. Improper use of the illuminant as a means of dramatizing the subject and/or creating the mood.

3. The arrangement of the subject material, in many instances, does not answer the presentation of the pictorial theme.

What are the vital points to be considered in improving your pictorial presentation? Skill is not acquired overnight and the spark of genius must be fanned before it can become the torch which lights the world with your handicraft. If you are to become a successful exhibitor of salon prints it is imperative that you remember the three points summarized above. The subject must be chosen with care and placed so that it has eye-appeal. The lighting, the manner in which it falls upon the scene and subject matter, the

highlights and shadows it creates must be studied and then utilized to create the mood you desire. Finally, the composition must add to the presentation of the subject so that all portions of the print lead to the center of interest.

That's all there is to it. Simple, isn't it? Well, perhaps, to you it isn't. If you have had your work rejected at club competitions, contests or salons and have wondered why they fail to measure up to acceptable standards, you can easily find out how to improve your technique by submitting prints for analysis. Just follow the few simple rules and you will receive a comprehensive, frank report as to the merit of your work and constructive criticism for its improvement.

Prints should be 5 x 7 to 8 x 10, sent first class with return mailing label and first class postage included. On the back of each print should be the maker's name, address, title of the picture, technical data and pertinent details. Also include a brief statement of the idea or purpose behind the picture, and the purpose for which it was taken (club contest, salon, etc.). To help the analyst do as good a job as possible, a contact print or small enlargement of the entire negative should be attached to the back of the print.

Prints should be sent to J. Elwood Armstrong, APSA, Director, 17402 Monica, Detroit 21, Michigan.

A. LYNNE PASCHALL, *Associate Editor*

Have you ever attempted to copy some other photographer's masterpiece? If not, you should try sometime. Our friend Joe Doakes once did and learned a lot by so doing.

It seems that Joe attended an exhibition where he saw a very marvelous and original print. It was a picture of a cow wearing a straw hat and was so cleverly done that nothing else in the show attracted half the attention. So our hero went home determined to make a picture just like it.

Of course, he did not have a straw hat of the exact vintage, and he couldn't find a cow with spots in the same places as the one in the masterpiece, so he had to make the best of what he had.

The blooming apple tree in the background was nowhere to be found at that season of the year, and the rippling brook was a mile away, so he had to be content with a hawthorn bush and some hay doodles that he wished were out of the way, but he went ahead and made the exposure anyway.

By the time the print was ready for the camera club his own style and personality were so thoroughly impressed upon it that all his friends knew at first glance who had made it. Joe admitted that he felt a little foolish while making the shot, and so the picture looked foolish too. That is one of the things about photography; try as you will you can't keep yourself out of your pictures.

I know one camera club that put on a "Copy Cat" program and had a good time out of it. If your club likes assignments you might try that sometime. Pick out an intriguing picture in PSA JOURNAL and let the ambitious photographers create one like it. You may be surprised at the results and you had better have some out of town judges pick the winner. Write to Henry McKay, Director of the Camera Club Judging Service, perhaps he knows some unbiased judges in your vicinity.

American Exhibits

For a dull month when new prints are slow coming in, there is nothing more stimulating than a one-man show from the hands of an expert. Fred Fix, Jr. has a nice group of these and if given sufficient notice can usually book the one that the club wishes.

Did you ever see any of those marvelous seascapes by John R. Hogan? Or Edward C. Crossett's portraits and landscapes?

PSA Recorded Lecture Program

The Recorded Lecture Program of the Pictorial Division offers the following programs for your club.

No. 1. An Analysis of Recognized Salon Prints by Ragnar Hedenvall, APSA
No. 2. Commentary on Recognized Salon Prints by Morris Gurrie
No. 3. Outdoor Photography by D. Ward Pease, FPSA
No. 4. Still Life by Ann Pilger Dewey, APSA, Hon. PSA.
No. 5. New Prints for Old by Barbara Green, APSA
SPECIAL Photography of the Nude by P. H. Oelman, FPSA

A deposit of $25.00 should accompany an order. A service charge is made for each Lecture. The SPECIAL costs $10.00 and should be ordered directly from Mr. Oelman. For clubs which are members of PSA but are not affiliated with the PD the charge is $6.50. Clubs which are affiliated with the PD will be charged $5.00. Clubs or groups not members of PSA will be quoted prices on request to the Director.

For Nos. 1 to 5 order from Philip B. Maples, Director, Recorded Lecture Program, 29 Spring Street, Brockport, New York.

For the SPECIAL please contact: P. H. Oelman, FPSA, 2505 Moorman Avenue, Cincinnati 6, Ohio.

Two PSA members get together in far-off places. Introduced by letters from Ray Miess, Frank A. Downie, of Nairobi, Kenya, East Africa, is visited by Leo A. Lyons, Port Kembla, Australia. Molly Lyons was along but she is behind the camera.

How about the show put out by the Photo Guild of Detroit? Write to Mr. Fix for his latest list. His address will be found on the first page of the Pictorial *Digest*.

Portfolio of Portfolios

A few clubs that have regular rooms like to have prints displayed on the walls on meeting nights. Early arrivals enjoy walking around and studying the pictures while waiting for the meeting to begin. I can think of nothing better for this purpose than the portfolio pictures assembled by Frances Robson. The cards are all 16" x 20" and each carries a group of six to ten smaller reproductions from prints that have travelled in portfolios, here and abroad. Write Dennis Anderson, giving dates when the pictures are desired. All you pay is the shipping charges.

Camera Club Print Circuits

Bill Hutchinson reports that the plan of making up a circuit of 8" x 10" prints hasn't received sufficient support to warrant its adoption, so he has laid the idea back on the shelf for the present. If the prices and taxes on photographic supplies continue to mount, however, we may be obliged to try it out before long.

Program activities naturally were at a low ebb during the early summer months, but with the advent of cool nights and signs of fall, inquiries started coming in. It now looks like a busy year ahead for Camera Club Print Circuits. Some clubs are signing up for the second or third time. This is the easiest way we know of to fill a program date. Only three prints are needed, and the service charge is just a dollar.

Recorded Lectures

From the present trend of affairs it looks like the Recorded Lecture Programs are to be the big news for this winter. This PSA feature is not only increasing in popularity, but its wide acceptance has enabled the Division to reduce the costs of these programs.

You will note that bookings for most of the recorded programs are now handled

by Philip B. Maples, of Brockport, N. Y. Since new lectures are constantly in production, write him for the latest list of available programs. Several new ones were presented at the Detroit Convention, but early deadlines prevent us from listing them for you.

The Pictorial Division sends the tape recording and the slides that go with it, but the club furnishes a tape player and a 2 x 2 slide projector. The material is generally sent a day or two in advance of the scheduled program date so a rehearsal can be held to insure smooth presentation of the program.

A deposit of $25 is required to insure safe return of the slides and tape, but the service charge is only $6.50 for clubs which are members of PSA but not the PD, and $5.00 for clubs affiliated with the PD. Clubs or groups which are not members of PSA will be quoted prices on request to the Director, whose address is in the masthead on the first page of this section.

Portfolian Clubs

The August number of the Pictorial *Digest* carried as its first article a comprehensive write-up of the Portfolian plan, and we suggest that you read it if you have not already done so.

Here is a brief resume about this activity giving you the what, why, and why not of Portfolian Clubs.

WHAT is the Portfolian Club? This is the first question the uninitiated asks regarding this activity of the Pictorial Division. Simply and basically the Portfolian Club provides a method whereby a member of the group may have the advantage of viewing and evaluating the portfolios of the other members of the group, at no additional cost. It also features "round table" discussion and comparison of ideas along photographic lines.

WHY should we have Portfolian Clubs? The hard way to gain knowledge is by self effort, the simpler and better way is by cooperative association, reasoning and comparison of ideas, methods, and techniques. In the Portfolian Club, PSA members also affiliated with the Pictorial Division and one or more of the Pictorial Portfolios, assemble whenever a member's portfolio arrives and all participate in the evaluation of the prints contained in the portfolio. Thus each member gets the benefit of all the data and comments of all the portfolios represented by the group. The greater the group the greater the benefits.

WHY NOT look into this and secure for yourself the advantages of cooperative effort leading to a better appreciation of all that pertains to technique and the know-how of good and satisfying photography. Organize such a group in your city or community and collectively reap these benefits.

Coming Salons Agreeing to Follow PSA Recommendations

Note: M-monochrome prints, C-color prints, T-color transparencies, SS-stereo slides, L-monochrome slides, A-architectural prints, S-scientific or nature prints. Entry fee is $1.00 in each class unless otherwise specified. Recognition: The monochrome portions of salons listed have Pictorial Division approval. Check salon list of appropriate division for recognition of other sections.

PSA (M, C, T, S, MP) Exhibited Oct. 9–Nov. 4 at Detroit Institute of Arts.

Houston (M) Exhibited Oct. 7–21. Museum of Fine Arts, Houston 5, Texas.

Mysore (M) Exhibited during November, Bangalore, India.

Chicago (M) Exhibited Oct. 20–Nov. 18 at Museum of Science and Industry.

Santiago (M, T) Exhibited Nov. 1–30 at Palacio de la Alhamara, Santiago, Chile.

Evansville (M) Exhibited Oct. 21–Nov. 3 at the Fine Arts Camera Club, Evansville, Ind.

Victoria (M, T) Exhibited at Empress Hotel Nov. 11–18. Victoria, B. C., Canada

Miss. Valley (M, C, T) Closes Oct. 17. Exhibited Oct. 29–Nov. 10 at Stix, Baer & Fuller. Data: Alvin W. Prause, 4152 Botanical Ave., St. Louis 10, Mo.

Ariz. State Fair (M, C, T) Closes Oct. 19. No fee, but entries returned "express collect" if return postage is omitted. Exhibited Nov. 5–12. Data: Dept. "R" Photography, Ariz. State Fair, Phoenix, Ariz.

Hong Kong (M) Closes Nov. 10. Exhibited Dec. 3–8. Entry fees waived. Data: Photographic Society of Hong Kong, Mr. Kaan, Se-Leuk, c/o Hang Shing Co. Ltd., 52 Bonham Strand East, Hong Kong.

Japan (M, T) Closes Nov. 15, 1951. Exhibited Jan. 15–22 in galleries of Mitsukoshi, Tokyo and later at other Japanese cities. Data: G. Ueno, The Asahi Shimbun Bldg., Yarakucho, Tokyo, Japan.

Milwaukee (M, T, SS) Closes Nov. 24. Exhibited Dec. 6 to Jan. 7 at Layton School of Art. Data: R. J. Lauer, c/o Milwaukee Glove Co., 807 S. 14th St., Milwaukee 4, Wisconsin.

Springfield (M) Closes Dec. 4. Exhibited Jan. 2–23 at Museum. Data: Secretary, Geo. Walter Vincent Smith Art Museum, Springfield 5, Mass.

Havana (M, T) Closes Dec. 4. Exhibited at the club, Dec. 14–Jan. 11. Data: Club Fotografico de Cuba, O'Reilly 366 altos, por Compostela, Havana, Cuba.

Minneapolis (M, C, T) Closes Jan. 14. Exhibited at American Swedish Institute. Data: Warren Anderson, 123 S. 7th St., Minneapolis, Minn.

Rochester (M, C, T, S, Documentary prints in M or C, large transparencies.) Closes Feb. 14. Exhibited Mar. 7–30 at Rochester Memorial Art Gallery. Data: Dr. Robt. F. Edgerton, 11 Fireside Drive, Rochester 18, N. Y.

Worcestershire (M, T) Closes Feb. 20. Exhibited Mar. 15 to Apr. 5 at City Art Gallery. Data: C. J. Morrall, 57 The Tything, Worcester, England.

Other Overseas Salons

Zagreb (M, C, News) Exhibited Oct. 28 to Nov. 18. Zagreb, Jugoslavia.

Zaragoza (M) Exhibited during Oct. Zaragoza, Spain.

Ghent (M) Exhibited Oct. 21 to Nov. 4. Ghent, Belgium.

Brussels (M) Exhibited Oct. 13–28 at Royal Museum of Art and History, Brussels, Belgium.

Ahmedabad (M) Closes Nov. 10. Exhibited beginning Dec. 22. Data: U. S. Dalal, Niharika, Pratima Studio Lal Bhuvan, Relief Road, Ahmedabad, India.

Lincoln (M, A, S, T, L) Closes Nov. 10. Exhibited Dec. 8 to Jan. 5 at Usher Art Gallery. Data: Lincoln Camera Club, 5 Monks Road, Lincoln, England.

Madrid (M) Closes Nov. 15. Exhibited during December. Data: Secretary, Real Sociedad Fotografica de Madrid, Principe 16, Madrid, Spain.

Lucknow (M, C, T) Closes Dec. 15. Exhibited during Feb. and Mar. Data: S. H. H. Razavi, 10 Cantonment Road, Lucknow, India.

Adelaide (M) Closes Jan. 26. Exhibited Mar. 7 to May 3 in Royal Adelaide Exhibition. Data: A. C. Willcox, 12 Pirie Street, Adelaide, So. Australia.

So. African (M) Closes Mar. 15. Exhibited May to August at Johannesburg and leading cities. Data: Peter Marples, P. O. Box 7024, Johannesburg, So. Africa.

PSA NATURE DIVISION

HARRY R. REICH
286 Schenck Street, No. Tonawanda, N. Y.

With the need for writing this column two months before the date of release of the issue in which it will appear, this writer finds himself quite frustrated at not being able to plug the 1951 National PSA Convention or to tell you what a good time was had by all at Detroit. We do feel perfectly safe, however, in saying that those who were present probably saw a show that they will remember for a long time. We feel that the Nature group, especially, enjoyed the program arranged for them.

Garden Slides Wanted

During the 1950 Convention ways and means for increasing PSA membership were discussed and your writer was of the opinion that the garden clubs of the country furnished a fertile field for recruitment of new members to the Society and the Nature Division.

It was decided that a fine collection of color slides that would be of interest to garden clubs and which could be made available to them for special programs, would serve as good publicity for PSA and would stimulate the interest of some of these folks in becoming PSA members. In an earlier issue of the JOURNAL this column made a plea for color slides to make up such a collection. The response to date hasn't been too bad, but, from the slides submitted thus far, it would appear that the Nature Division members who read this column are confined to the northeast section of the country and adjoining Canadian provinces only. I don't mean to be facetious, but all of the slides sent in at this writing come from members in this area, and depict gardens and flowers native to this section.

While I feel certain that this column is read by members in other areas, I will not be convinced until we receive slides from them. Seriously, we would like to make this collection something that will evoke favorable comment and really stimulate interest in PSA. To accomplish this we should have a set of slides that will be representative of all that is fine in the gardening world. I am sure that our foreign members would also like to see their gardens represented in this collection. Let us see some of these foreign gardens, some west coast gardens, some from the mountain states and the south as well as east coast gardens. For the benefit of our Arizona members the only cactus garden slides we have to date came from Ontario, Canada. For the benefit of our Florida members the only slide showing flowers typical of your state was made in Rochester, N. Y. Surely, you folks will not stand for that, or will you? I hope not!

Send your slides for this collection either to the writer or to the Division Secretary, Ruth F. Sage, 49 Johnson Park, Buffalo, N. Y.

Pictorial Exhibits

A number of nature enthusiasts seem to be of the opinion that their photographic efforts are appreciated only by themselves and a select clan known as Nature Photographers. Consequently, they slide into a rut the pattern of which is familiar to most of us. After putting a lot of thought and time and effort into producing pictures of their chosen subject matter, they will submit them to the half dozen nature exhibitions and then retire them to the seclusion of their private files, sometimes with an enviable record of acceptances in those exhibitions. It would seem that many of these pictures were deserving of a better fate, so why not give them a chance. Send them to some of the pictorial exhibitions and let them compete with the best that the pictorialists have to offer. You may experience a pleasant surprise, one that will force you to revaluate your photographic efforts.

When you stop to consider, why shouldn't nature slides and prints compete favorably with the efforts of the pictorialist? Aren't the elements of a good nature photograph very similar to those of a good pictorial, except for the limitations as to subject matter? My experience with nature juries is that the same elements that motivate pictorial juries in their decision also motivate the nature judges, that is their opinions are based on originality, composition, interest-value, and technical excellence.

We would like very much to see members of the Nature Division give their pictures the chance to which they are entitled. Send them out to the pictorial shows and see how they fare. If you need any further encouragement to give it a try, look up the records of two individuals that I consider brilliant examples of nature photographers with real pictorial accomplishments. I refer to Gottlieb Hampfler, FPSA, and the late Dom Chiesa, APSA. These two gentlemen, strictly nature photographers at heart, established enviable pictorial records in monochrome shows with their favorite subject matter. If you are a nature color enthusiast, you have only to check the current "Who's Who in Color Slide Photography" to see what a fine record Edward A. Hill, APSA, compiled this past year with his color slides of native birds, and recall that this is the listing of pictorial photography in color.

I have in mind another incident that may help to convince you that nature pictures have pictorial possibilities. One of our leading nature exhibitors determined to test his theory on the value of nature prints in pictorial competition. His camera club conducted monthly print competitions in which the prints were scored strictly on the elements of a good pictorial print. At the end of the year the club made awards based on the total score amassed in the 12 monthly competitions. This member submitted 12 strictly nature prints, all of which have since been accepted in recognized nature exhibitions. At the end of the year it was found that he was the winner of first prize in the total scores for the year.

There are a number of State and County Fairs that conduct photographic exhibitions in which you will find that your nature pictures are well received. Aside from winning the traditional blue ribbons, you may find that there are also cash awards that go with these ribbons that aren't hard to take. So don't sell your nature prints short, give them a chance to prove their worth.

Louisville Nature

The Eleventh Annual Salon of Nature Photography (1951), sponsored by the Ohio Falls Chapter of The Kentucky Society of Natural History, is coming up. The deadline for this show is set for November 14. Information may be obtained by writing to William F. Furnish, 1386 S. Third Street, Louisville 8, Kentucky.

PSA COLOR DIVISION

GEORGE F. JOHNSON, APSA
Forestry Building, State College, Penna.

Club Color Slide Circuits

The Club Color Slide Circuits for the 1950-51 season have come to a most satisfactory close. Comments by participants indicate that this informative type of slide show has given them a full evening's entertainment and has increased interest in the project. In 1948 there were 29 entries; 35 in 1949; 43 in 1950, and 61 in 1951 with some of the clubs entering more than one circuit.

If your club is not a member of PSA Color Division, see that it pays the nominal fee of $1.00 and thereby reaps the benefit of this and all the other C.D. activities without further cash outlay except postage. Most clubs today do some color work, and this is one way to evaluate your efforts by viewing what other clubs are doing and at the same time have a little competitive fun for medals and ribbon awards. This naturally is the incentive for better slides, and if you had followed the slide circuits over the past years, you, too, would be greatly pleased with the increased quality shown.

Members of 21 clubs throughout the U. S. won medals and ribbons in the seven circuits during 1950-51. One medal and three prize ribbons are awarded in each circuit according to the popular vote of the participating clubs.

Naturally, the purpose of the circuits is to acquaint the color shooter of one club with the work of the other, so at least three members should be represented in one entry.

The 2x2 size slide is still the only one accepted in the circuits as most clubs do not have the facilities to show other sizes.

When slides are in a show for three months, they go through a lot of handling, and glass mount is to be preferred for the added security it affords. There are a number of slide mounts on the market today, metal, plastic, combined paper and glass, etc., but in our experience in handling all the circuits we have found the glass with taped edges to be the best all around binding and protection for your slides. It gives you a chance to shift your transparency in the mask or crop to suit your choice of subject and composition, and at the same time any gummed tabs or identification stickers are easily affixed or removed from the glass without damage to the slide or its mounting.

Following are some interesting comments received from clubs which participated during the 1950-51 season. The Boston Camera Club had this to say: "Perhaps it would be interesting for you to learn of the reaction of our Color Division to the showing of Circuit 51-A. You know that this is the first time the Boston Camera Club has entered any of these with a view to find out if the showing of these circuits makes a worthwhile program. I requested an opinion from the club members and was very happy to learn that they felt that we should continue to enter these circuits, mainly because they give us an opportunity to see some of the work being done by members of other clubs throughout the country." This last phrase illustrates exactly to a T the mainspring of all good fellowship in photography, namely to see and give constructive criticism of the other fellow's work.

Comments like these from Fortuna Color Slide Club, Fortuna, California, are very encouraging: "Our club enjoyed this set very much. We had our largest attendance this year for the showing of these slides. As a whole they were very good, with some very unusual ones among them. *Let's do it again,*"

The North Shore Cinemacrafters, Beverly, Massachusetts, turned in a fine report on their showing of the circuit. They are looking forward to the collective comments by the other clubs on their slides. George D. Huff, of the Cinemacrafters, writes: "A group of our members viewed the set and prepared our comments. Then the comments received from the other clubs were read and a digest prepared to use with the slides at the club meeting, and this digest recorded on wire for transcription. I want to assure you that our club feels it has benefitted and appreciates the effort it must take to assemble and schedule a circuit."

Lyle E. Downes, of Silver Bow Photographic Society, Butte, Montana, writes: "Our club enjoyed this set of pictures immensely and it certainly made a program for a very interesting meeting. Our members have expressed a desire that the PSA Color Division continue these traveling exhibits. Thank you, PSA, for an excellent program."

Not alone did the camera clubs enjoy their evening's programs; some went further than that. Two clubs, who became acquainted through one of these circuits, have made special arrangements to interchange slides for their programs as well as for criticism. This is a fine comradely way of gaining new acquaintances and friends at the same time furthering their study and pleasure of color photography.

There were very few creative slides included in the circuits this season, mostly landscapes, seascapes and nature in all its beauty; but the creative mind of the exhibitor has hardly been touched. More thought should be given to planned slides for variety in shows. Color is a medium

of expression, and when used so, far exceeds mere recording of subject matter.

Several good suggestions have been received during the season from the participating clubs, and if it is possible and practicable to include any of these the coming year, it is our aim to do so.

For full information write Erik Sorensen, 3836 Roscoe Street, Chicago 18, Illinois.

Anchor them Down!

At the judging of the 3rd New York International, more than 25 slides were projected that had slipped in their mounts, so that unwanted white areas were shown. This was in spite of all the efforts of the committee, short of remounting the slides, to remedy the condition. Again, at the Hartford International, a similar condition was seen.

The dangerous thing about this is that it gives your slide two strikes to start with. Very few of the slides that have slipped were able, if you will pardon the pun, to slip by the judges. Most of them got the old "heave-ho." The answer is—anchor them down. If you do that, you can be sure that the judges will see what you want them to see, not more nor less.

It is not hard to do. When you're putting your slide into glass, use a small piece of tape along the long edges. Your regular mounting tape will do fine, or Scotch tape will answer very well. It is well to be cautious, and use two pieces, one on each long edge. And if you are taking advantage of the opportunity to straighten up a vertical, or level a horizon, you can ignore the half-moon cutouts. They are of no real use anyway, and using them leads to Newton rings. So try ignoring them, and insure the proper presentation of your slide by anchoring the transparency down!

PAUL J. WOLF, APSA

"Curtain Time?"

Have you wondered why so many color slides are not accepted in international exhibitions?

Have you analyzed rejections fairly, seeking possible flaws? Do you try to improve your work as a result of that analysis?

Or, do you blame the judges?

Of course, it is always easier to put the blame on an absent jury. However, in all fairness, let us try to discover just what is acceptable to present-day judges—and wherein we may have failed to provide it.

Let us take into account, first of all, that there have been gradual yet obvious changes in the types of color slides accepted in most exhibitions since color was first admitted. Gone are the picture post-card scenes, the flat-lighted portraits and still lifes. Gone, too, are the ordinary, the trite, the monotonous subjects that found their way into our old-time "salons."

Today we are told that subject matter itself is relatively unimportant. It is what we do with it that counts. Most international exhibition juries seek *creative color*. They believe that a contributor to an exhibition of international scope should be sufficiently experienced in photography to be able to exercise individual control over his medium. Materials and equipment are constantly being improved in order to make this control even greater. The exhibitor has been freed from the old bug-a-boos of 10:00 AM to 2:00 PM outdoor shooting, from the 45 degree artificial lighting of yesteryear. He is free to depart from the rules, free to originate his own ideas, to make color dance to his tune.

Today's exhibition judge expects new music, an eye-catching costume, and a brilliant performance from each slide he views. He expects it because he knows it can be achieved *with care*.

The long hours of painstaking rehearsal necessary for the perfection of a smooth ballet routine are not actually witnessed by the audience on opening night. Yet, no smallest detail that might make or mar the final production has been overlooked during those rehearsals.

The success of the show is assured only by its emotional impact upon the audience, by a performance perfectly executed. Technical details necessary to its accomplishment show only in obvious flaws.

And so it should be with color photographs. Each slide that we enter should be as perfect in *every detail* as we know how to make it.

When we consider that the average international exhibition receives from many hundreds to several thousand entries we should realize that the amount of time a jury can devote to the selection of the allotted number to be exhibited is, of necessity limited. Therefore, judges must look for only steller performers.

Exhibition juries cannot be concerned with rehearsals. They must base their judgment upon the entire premier performance. If they are forced to guess what story we are trying to tell, if their eyes are immediately drawn to obvious technical defects that we should have caught, our entry has little chance of acceptance.

Don't blame the jury. In most cases we'll find that some carelessly handled detail, in rehearsal, kept our slide from being the star of the show.—VILLA L. FINNE

First Stereo Circuit

The first stereo slide circuit was completed recently with booming interest, according to Frank E. Rice, circuit chairman.

Here are a few of the significant points gleaned from the circuit's notebook:

Geo. W. Blaha, APSA, the circuit's commentator states: "Even though stereography has the added factor of depth perception, this will not elevate a commonplace subject to the realm of pictorialism. A stereo picture to be successful must be sharp throughout for it duplicates in every way the original scene, and it is unnatural for us to see objects out of focus. Accidental mergers of objects in the foreground with those in the background are no problem in stereo for they enhance the depth. Stereographic composition is not limited to one plane, so classic pictorial composition loses some of its force when applied to the three-dimensional picture. A new standard of composition must be formulated. Other than recognizing the importance of the value of unity, harmony and balance, no formalized rules of composition have yet been set down."

Chas. A. Howe, a stereo photographer of long experience and wide travel says: "We have been oversimplifying pictures. Stereo may get us to linger more over pictures and get all the good out of them."

W. C. Day comments: "A view that is far too busy to make an interesting black and white print, may not be too busy in stereo because you see the scene as it really is."

Max W. Sorensen reports that he exposes stereo slides to set the mood, not to secure the perfect exposure. Very often, he says, he deliberately underexposes slides because many of them can stand more deep color.

If interested in joining this interesting group of stereo workers, write Frank E. Rice, 307 North Michigan Avenue, Chicago 1, Illinois.

Color Print Contests

Three color print competitions have been organized during the coming year in which individual workers in this field may compete for cups and ribbons and at the same time receive an evaluation of their work. No entry fee is required of Color Division members. Non-members pay $1.00 for the season. The closing dates for the contests are November 20, February 20, and May 20. Prints may be any color process, including hand coloring. An entry form and full information can be secured from W. H. Savary, R.F.D. #2, Plainfield, New Jersey.

The Moon in Color

Less experienced color shooters are often curious about whether it is possible to picture the moon on relatively slow color film. Since the moon is in exactly the same category as any other object lighted by direct sun, there is no difficulty in recording the moon with any ordinary exposure—say, 1/25 or 1/50 second at f/8.

However, the size of the moon's image will be quite tiny in a transparency; even with a long-focus lens, as a 90, 105, or 135mm with the popular 35mm type of camera, the size of the moon's disc will still be small. The color pictorialist may indeed feel that he could get just as effective a result by punching a pinhole through his transparency in the desired spot.

There is, luckily, at least one way in which the apparent size of the moon can be greatly increased. By picking a night when the moon is full, and when light, hazy cloud wisps are drifting across its face, the illusion can be created that the moon is much larger than it really is. For this purpose a time exposure is needed; frequent experiments have shown that two minutes at about f/3.5 will give good results. The camera, of course, must be firmly placed on a tripod, a cable release should be used, and it is desirable to set up the tripod in a spot sheltered from sudden gusts of wind.

By choosing a time when the full moon is rising, and by silhouetting trees, a house or barn, tall buildings, or other nearby

objects against the drifting cloud fragments, pleasing effects can often be secured.

It is not necessary to stop down to a small lens opening for this kind of picture; depth of field is not important. In fact, a slight softness in the tree or building silhouettes may actually help the "feel" of the picture.

Daylight-type film is advisable, again because the moon is illuminated by direct sunlight. However, either Kodachrome Type A or tungsten-type film can be used; in this case, the moon and cloud haze will appear much more cold and silvery.

Color workers who like to experiment by binding tinted gelatin with their slides can secure interesting pseudo-moonlight effects. A snow or beach scene, for example (be sure to choose one with good cross-lighting to give texture and shadows in the sand or snow) can be bound with pale blue gelatin, or with a combination of pale blue and light green, to get a moonlight illusion that is sometimes quite realistic and almost startling.

This type of "moon mockery" can be lots of fun to experiment with on one of these rainy autumn nights.—H. G. MITCHELL

Coming Color Exhibitions

Chicago Lighthouse Stereo, Dec. 4–8, deadline Nov. 10. Four stereos, $1. (Realist mounts or identical dimensions, 1⅝x4 inches). Forms: G. W. Blaha, Chicago Lighthouse for the Blind, 3323 W. Cermak, Chicago 23, Ill.

Milwaukee, Dec. 8–Jan. 7, deadline Nov. 24. (Also stereo). Entry fee $1. Forms: R. J. Lauer, Milwaukee Glove Co., 807 S. 14th St., Milwaukee 4, Wis.

Cuba, Dec. 14–Jan. 11, deadline Dec. 4. Four slides (up to 3¼x4), $1. Forms: Club Fotografico de Cuba, O'Reilly, 366 altos, por Compostela, La Habana, Cuba. (Or we have forms available from H. J. Johnson.)

Wilmington, Feb. 3–25, deadline Jan. 13. Four slides, $1. Forms: Mrs. Don Tribit, 3 S. Lake St., Elmhurst, Wilmington, Del.

Chicago Nature, Feb. 1952, deadline Jan. 15. Four slides (up to 3¼x4), $1. Forms: Blanche Kolarik, 2824 S. Central Park Av., Chicago 23, Ill.

Minneapolis, Feb. 12–14, deadline Jan. 21. Four slides, $1. Forms: Warren Anderson, 123 S. 7th St., Minneapolis, Minn.

Philadelphia, March 8–30, deadline Feb. 16. Four slides, $1. Forms: Clarence A. Rossman, 1637 S. 54th St., Philadelphia 43, Pa.

CAMERA CLUBS

H. J. JOHNSON, FPSA
2134 W. Concord Pl., Chicago 47, Ill.

Every club, some place in its activities, should include a project for the collections and distributions of prints or slides to veterans' hospitals. (Is it necessary to explain why you should do this?) Such donations will be genuinely appreciated, as indicated by letters such as the following:

TO THE PSA CAMERA CLUBS COMMITTEE
Dear Mr. Johnson:

Today we received two packages of extremely interesting pictures. They have been not only most acceptable as decorative additions to some of the buildings but have been studied by many men who are interested in photography and who belong to the various camera clubs which we sponsor in the hospitals.

Some of the pictures that have been more amusing have been placed in the children's wards, much to the delight of the little patients. In case you don't know, children in military hospitals are the dependents of servicemen. The same is true of hospitalized women with whom we have also shared some of the pictures.

Please accept our sincere appreciation for your organization's lovely gifts.

RUTH E. WOLFF,
Military Hospitals Service, American Red Cross, Pacific Area,
1550 Sutter St., San Francisco 1, Calif.

[Note: The address is given so that you will have at least one address to which your club's donations may be sent.]

Editors Receive Honors in Bulletin Competition

Camera club bulletins from all over the world were represented in the recent International Camera Club Bulletin Competition, with the total entries again exceeding those of the previous competitions.

Highest rated bulletin in the "A" classification was The Camera Club (N. Y.) "Camera Notes," which won its editor, Helen C. Milius, a medal and its club a plaque.

In the "B" classification, the "Bulletin" of the Detroit Photo Guild won its editor, Audrey Gingrich, a medal and plaque for the club.

Other medal winners were

Medal	*Editor*	*Bulletin*	*Club*
2nd A	Norman Connor	Fotomic Facts	Buffalo Science Museum
" B	Dorothea Ward	Southerner	Memphis
3rd A	Fred Andrews	Gammagram	Sierra
" B	R. B. Horner and (tied)	Projector	Chicago Color
	Allyn K. Thayer	Thru the Darkroom Door	Cleveland Pho. Soc.

Blue ribbons winners were:

Bulletin	*Club*
Reflector	Boston
Focus	Toronto
Foto-Cine	Club Fotografico de Cuba
Flash	Bozeman
News	El Camino
Jackson Parker	Jackson Park
Panoram	Oakland
News Flashes	Chicago Cinema
Bulletin	Delaware
Viewfinder	Endicott
Crier	Germantown
Bulletin	Johannesburg (S. Africa)
Bulletin	Nashua
Focal Plane	Ridgewood

Honorable mention ribbons went to:

Lights and Shadows	Baton Rouge
Foto-Cine Boletim	Foto-Cine Clube Bandeirante (Brasil)
Spotlight	Longbeach
Boletin	Club Fotografico de Mexico
Retina	Retlaw
Focus	Atlantic (Canal Zone)
Shutter	Berkeley
Darkroom Dodger	Brooklyn
Nippon Image	Circle of Confusion (Japan)
Shutter Times	Coral Gables
Local Focal News	Denver Gas & Elec.
Viewfinder	Endicott
Viewfinder	Everett
Ft. Dearbornite	Ft. Dearborn
Crier	Germantown
Bulletin	Johannesburg
Bulletin	Light and Shadow
Test Strip	Lincoln
Finder	National Photo. Soc.
Reflector	New Westminster (Canada)
Rainbow	New York Color Slide
Graphic Gazette	Pittsburgh Suburban
Focal Plane	Ridgewood
Bulletin	Southgate (England)
Color News	San Francisco Photochrome
Bulletin	Seven Hills Pho. Soc.
Exposures	Springfield Pho. Soc.
Snapshots	Waikato (New Zealand)
Highlight	Christchurch (New Zealand)
Boletin	Club Fotografico de Mexico
Viewfinder	Mysore (India)
Retina	Retlaw
Flash	Bozeman
Light n' Lens	Diablo (Canal Zone)
Newsletter	Lake Shore
Reflector	New Westminster
Chatterbox	Poly Photo

Judges were Rita Connolly (camera club editor of *The Camera*), Whit Hillyer (camera club editor of *Popular Photography*), and H. G. Mitchell, instructor in journalism. The judges rated the bulletins independently of each other, and each club received the three score sheets, including suggestions on improving their bulletins.

Because of world-wide representation and the large number of entries, it is evident that the winners listed above are the world's best camera club bulletins.

STEREO

DON BENNETT

There are a lot of tricks that can be done with stereo. Some of them are simple, some are difficult. Unlike the wartime sign, we'll leave the difficult ones for tomorrow.

If you are a stereo fan, you've probably had the pleasure of introducing stereo to a friend and getting extra fun out of his reaction to it. They all seem to say about the same things:

"Why it looks real!"

"It's just like the real thing!"

And so on and so on, ad fulluptohere.

They usually follow with, "Did you make them?" which is, of course, the crowning insult. Who else could have made such beautiful stuff!

To teach ingrates like this a lesson, I have a special set of slides. I pass them along without any special comment, at first, that is, then I go into my patter.

The set was all made from a little bridge, looking upstream at a small dam, with a pond beyond. First slide is for the right eye only. The left side is covered with black paper. Next slide is two left eye shots. Third slide is a normal right and left. (Maybe I should add a fourth, transposed for pseudo stereo. Have to think that over.)

Oh, yes. There is a nice tree branch halfway between the bridge and the dam.

With the neophyte looker I let him hold the viewer and load and unload it myself. Here's about what happens:

(Business of inserting slide No. 1.)

"Here's a beautiful scene, made back in the hills not far from home." (By this time he has blinked, lowered the viewer and looked at it, must be something wrong

Wintertime . . .

It's the creative season of the year when you really appreciate fine enlarging equipment. You're a happy man when you have a Kodak Flurolite Enlarger with a Kodak Enlarging Ektar or Enlarging Ektanon Lens. Your prints will be sharp, crisply detailed, uniformly exposed from edge to edge—with negative scratches and small defects reduced to a minimum by the Flurolite's "integrating sphere" illuminating system. You focus easily—controlling the head elevation with one hand and the lens movement with the other, *simultaneously*, with no tedious locking, checking focus, and unlocking. You can put any part of the negative on the center of the easel . . . rotate the carrier to any position in a full circle . . . and correct perspective distortion in *all* planes. You know the sturdy 40-inch steel column guards against vibration during exposure, and the rigid bar-frame head supports won't get out of line. When you want a sheet of paper, you simply reach into the big, light-tight cabinet base. For maximum efficiency with various negative sizes, you can switch lenses in a couple of seconds. And, with accessories, your versatile Flurolite can be used for copying, closeups, photomicrography, microfilming, movie titling, slide making . . . or as a view camera! Price, with one negative carrier, without lens, $112.50.

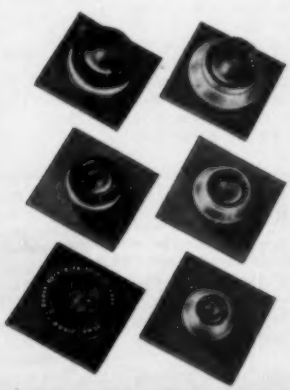
Kodak Flurolite Enlarger in use with new $11.25 Kodak 11 x 14 Masking Easel

KODAK ENLARGING LENSES

Lumenized for maximum light transmission, all Kodak enlarging lenses are designed for top correction at close working distances. Because they have special lateral and longitudinal color correction, Kodak Enlarging Ektar Lenses are recommended for use when color requirements and definition are above the standards of normal photographic work.

Kodak Enlarging Ektanon Lens	For negatives up to —	
50mm. *f*/4.5*	1 3/16 x 1 9/16 in.	$15.75
3-in. *f*/4.5*	2¼ x 2¼ in.	25.75
4-in. *f*/4.5*	2¼ x 3¼ in.	32.75
5½-in. *f*/4.5	3¼ x 4¼ in.	50.00
6½-in. *f*/4.5	4 x 5 in.	55.00
Kodak Enlarging Ektar Lens		
2-in. *f*/4.5*	1 3/16 x 1 9/16 in.	49.75
3-in. *f*/4.5*	2¼ x 2¼ in.	52.50
4-in. *f*/4.5*	2¼ x 3¼ in.	56.00

*For the Kodak Flurolite Enlarger



Darkroom Time . . .

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with his eyes, he tries again). You'll notice how that branch sticks right out . . . Something wrong?" (Pull slide out).

"Sorry, I gave you the wrong slide, something happened to the left eye shot on that one. . . .Here, try this one. . . . (Slide No. 2). That other one was what you see with an ordinary camera, one-eyed, you know. Well, with this one I'm sure you can see that branch between the bridge and the dam. You can't? Let me see the slide. . . .(Palm Slide No. 2 and slip in No. 3). Must have had it in wrong or something. *Now* can you see the branch? You can? Maybe you're just not used to looking at stereo." (That puts him in his place, alright.)

Don't bother to memorize the script. If you get the idea, you'll ad lib your own as you go along. The only thing that will astonish you is the uniform manner in which they fall for it.

That trick is a little childish but it is a start towards creating your own bag. There are others you can do, like mixing two shots, particularly if the backgrounds are identical, but people are in different locations. You can do this one by mounting your camera on a tripod and covering each lens in turn as you take shots a couple of minutes apart.

Then you can make double exposures. It's better to start out on these as a mixture. Make a normal stereo shot, then make an extra exposure on one frame indoors against a black background. That will give you a planar ghost against a stereo scene. To put a stereo ghost in the scene requires some extra planning, particularly if you want to make a tiny fairy sit in a shoe or something like that.

We're going into this trick thing in more detail later on. In the meantime, if you have any good ones, why not let us know how you did it. We'll always credit the maker.

We write this column way ahead of time. All big magazines work that way. So as we write this your September copy is about half read. The whole point of this is that we have now discovered we have a reader. Yep. Our first fan letter has arrived! Here we thought we were talking to ourselves all the time.

* * *

Stereo is sure spreading. Passing a toy store the other day we saw a stereo outfit. Yep, a plastic viewer with lenses and ten sets of stereo slides in full color, all for a dollar. Each set was a story in itself. We bought it.

The "slides" are drawings, lithographed in colors but with real stereo effect. Naturally, the objects do not have the roundness in themselves that we get with stereo photography, each object is like a planar cutout but the relative distances are maintained. The artists did an excellent job. Our young sprout complained that there weren't enough, and there was no catalog or order form for more slides.

* * *

Stereo seems to be catching on in other ways, too. Busch is out with the Verascope and now comes the Videon in the medium price field. Both of them take real nice stereo, too.

Matter of fact, the other day we saw a slide made with the Videon that showed more stereo effect than we'd been aware of in a long while. Grove Mayer was touring through Canada and stumbled on a small ex-lumber yard that had started burning about an hour before. In that hour the office burned completely out, all but the front wall of cement block. Wisps of smoke hung at various levels in the foreground while in the back the lumber piles burned merrily on. The thing that struck us was the way those delicate smoke shreds hung there at different distances.

We hear that Sawyer, who have made the Viewmaster stereo disc so popular, will soon hit the market with a 35mm stereo camera. Everything will be conventional but the mounting and viewing, which will be similar to their present discs. We're not quite clear whether the same viewer will be used, but apparently the disc system will be used.

Aside from this, there is a whole rash of viewers, slide files, binders and the like being offered to stereo fans. Among the familiar names offering viewers are Brumberger and Keys.

It begins to look as if, after the first hundred years, stereo photography is being given the attention it really deserves.

Too much credit cannot be given to the stereo addicts who have kept it going all these years, paying extremely high prices for cameras that used odd-sized plates that usually had to be especially ordered . . . going through the ordeal of printing and mounting their own . . . swapping and lending slides back and forth among the very few who were addicts, all to keep alive a form of photography that has more to offer than any other phase, when you come right down to it.

This last statement is not too strong, nor is it the warped view of an addict. We usually lunch at a table with a group of non-photographers through force of neighborhood. Once in awhile a proud poppa or grandpop hands around the latest snaps. Polite but bored interest. One day we took a viewer and slides to lunch. None of our offspring on the slides, but a variety of pictures, some vacation scenes, some odd shots, a few scenics . . . nothing startling.

After the initial exclamations about stereo, the viewer just traveled around the table slide by slide with that peculiar secondary effect—where the looker thinks everyone else can see, too. After our 30 slides ran out, everyone was disappointed that there were no more. Strangest of all, we have had several requests to bring it in again!

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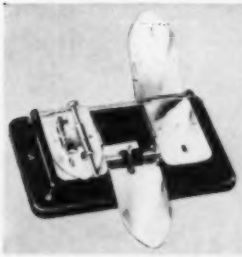

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psa JOURNAL SECTION b

PHOTOGRAPHIC SCIENCE AND TECHNIQUE

A quarterly technical supplement to PSA Journal

FOURTH 1951 ISSUE ☆ PUBLISHED WITH VOLUME 17, NUMBER 11 ☆ NOVEMBER 1951

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Fig. 1. Photograph of bride and groom with and without background illumination.

USING MULTIPLE ELECTRONIC FLASH FOR *CANDID* PHOTOGRAPHY OF WEDDINGS

J. M. PURCELL*

Photographic Technique for Professionals

THE INCREASING use of electronic, high-speed flash in candid photography of weddings has opened up several possibilities of experimentation and improvement in picture quality. Photographers usually employ for such pictures a flashgun attached to the side of the camera, although sometimes the flashgun is on an extension at a distance from the camera directing the light to the subject at an angle so as to overcome flat lighting effects. Although difficult to undertake in the confusion of a wedding reception, considerable improvement would result from the use of three lights: a fill-in flash at the camera, a modeling light directed at an angle, and a flash to illuminate dark backgrounds. A background light is particularly desirable in any large room, such as a hotel ballroom, where the walls are too far away to be lighted by "bouncing" illumination.

Many times during the past few years experimental candid wedding photographs have been made by these studios, using a second electronic flash to illuminate the background. Since long electric cords are impractical, the second flashtube has been synchronized by a light-sensitive trigger tube which is set off by light from the flashgun connected to the camera. The second light, sometimes called a "slave unit," is manipulated by an experienced assistant, one who can anticipate how and where the illumination should be directed, and one who can do this without making a nuisance of himself. Figure 1 shows the effects obtained with a single electronic flash attached to the camera, with and without background flash. Although indiscriminate background illumination can be unlovely, a complete record of subsidiary details is welcomed by the bride and groom in most instances.

Having mastered the technique described above, it was natural to consider the possibility of flooding an entire room with light by means of a number of strategically-located electronic flashtubes, each synchronized by a photoelectric trigger tube. Professor Harold Edgerton, of the Massachusetts Institute of Technology, generously assisted with advice and the use of his equipment. We are deeply grateful for his help.

* Bachrach Studios, Newton, Massachusetts. Received 10 September 1951.

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A wedding reception to be held in the Oval Room of the Copley Plaza Hotel in Boston was chosen for the initial experiment. Even though the walls and the high ceiling were light-colored, a tremendous amount of light obviously was needed to illuminate the 150 foot long room. Two large electronic flashtubes were installed at opposite ends of the ballroom. Each unit employed an FT503 tube, in a 10-inch reflector, energized by a capacitor storing 1600 watt-seconds, and synchronized by a special photo-electric trigger tube of great sensitivity.

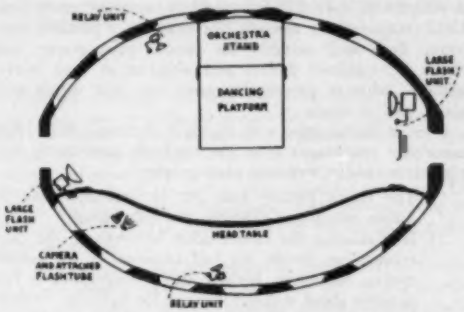


Fig. 2. Diagram of flashtube placement in the Oval Room of the Copley Plaza Hotel in Boston.

The reflectors were pointed at the ceiling and tests were made with a Polaroid Land camera, whose 1-minute pictures provided repeated trials without waste of time. The directions of the lights were changed after each test, until the illumination was even throughout the room. The trigger tubes were intended to respond to the flashtube on the camera no matter where in the room it was fired. During the course of the tests, however, it was discovered that this did not happen when the camera and its flashtube were used in certain locations. In order to overcome this limitation, small flashtubes were set up at the sides of the room and directed at the trigger tubes of the main units. The small units contained FT110 tubes, 80 watt-second capacitors, and trigger tubes similar to those used in the large units. These small units were used largely as "synchronizing relays", so that the large main units would fire no matter where in the room or in what direction the camera flashtube was fired. The additional illumination they provided was incidental. The location of each lamp and the general arrangement of the room are shown in Figure 2. Although a camera position is indicated (incidentally the one used for Figure 3), it should be understood that the camera could be and was used anywhere in the room—for long-shots or close-ups as desired.

Of the many photographs which were made in the course of this experiment, two are reproduced here to illustrate the results obtained. Because there is no evident falling-off in illumination, the couples shown dancing in

Fig. 3. Photograph of dance floor during a wedding reception using multiple electronic flash lamps.

Fig. 4. Photograph of seated guests at a wedding reception using multiple electronic flash lamps to illuminate the entire room.

Figure 3 can be easily recognized and details throughout the room are clearly visible. Figure 4 is perhaps even more indicative of what can be accomplished by the techniques used in this experiment. The light patterns on the people's faces are interesting, the shadow areas are softly and delicately illumined, hair is nicely highlighted, and detail persists throughout the field of view. With full illumination, the background has become alive. The groups at neighboring tables, although not attentive, add a descriptive charm which greatly enhances the story-telling quality and completeness of the picture.

At the conclusion of the experiment several improvements in technique were indicated by the results. First, better photoelectric triggering equipment should be devised for effecting synchronization of the main flashtube units from the camera flash. Second, the cameraman should have two or three diffusion screens of different densities which could be placed readily over his flashtube to bring its light output into balance with the overall illumination.

It is obvious that the equipment necessary for an undertaking of this size is both expensive and bulky. The large units which were used weigh about 350 pounds apiece. Although in general the intensity of light delivered by electronic flash units is gained only at the expense of weight and cost, it is true that there is a trend of new developments toward lighter and less expensive equipment. Until comparatively recently, for example, a portable electronic flash unit suitable for candid photography cost about two-hundred dollars and weighed at least twelve pounds; whereas present-day units cost and weigh only about half as much.

Overall illumination with multiple electronic flash offers numerous advantages over the methods customarily employed in candid wedding photography.

1) The entire picture area can be recorded with its details which are valuable and interesting.
2) By balancing the illumination beforehand, the cameraman can devote his full attention to the subject matter. Moreover, because the photographer is free to move about without concern for lighting, interesting events and spontaneous expressions can be more easily obtained.
3) Lighting arrangements can be worked out carefully and leisurely beforehand, and the best positions determined by easily-made tests.
4) The services of a skilled assistant are not required, which reduces confusion and costs.

It was concluded from the results of this experiment that multiple electronic flash offers considerable promise of improving the technique of candid wedding photography.

The Behavior of Selenium Photocells During Irradiation of Short Duration

J. EGGERT*

SUMMARY

With high light intensities and short-time irradiations, as they are generated by the flash discharges employed in photography, the selenium photocell yields current pulses, and these produce deflections in a ballistic galvanometer which become proportional to the impinging radiation only when the original radiation of the lamp has been reduced by at least four powers of the original level used in our experiments.

The decrease of light intensity with increasing distance from the lamp has been determined for an electric flash light source, and it has been found that the inverse square law holds within practical limits beyond the distance of about 1 meter.

The increasing application of short-duration light sources and of photoelectric exposure meters in photography suggested the experiment of measuring rapidly occurring light emissions ballistically with a photoelement to study the phenomena involved.

*Photographisches institut der Eidgenossischen Technischen Hochschule, Zurich, Switzerland. Received 21 March 1950. Reprinted from "Zeitschrift fur Physikolische Chemie" Vol. 196 (1950). English translation by G. A. Wiesehahn.

The light source used was a Buckley Speed-Lite instrument Type T2. It contains a spiral shaped cylindrical discharge tube, 34 cm long (3.5 mm inner diameter) of 4½ turns which have a diameter of 29 mm and occupy a total height of 41 mm. The tube is manufactured by General Electric Company as Type FT 220 and is operated (according to the instructions of the manufacturer) in parallel with a condenser of 32 μF capacity at 2500 V.

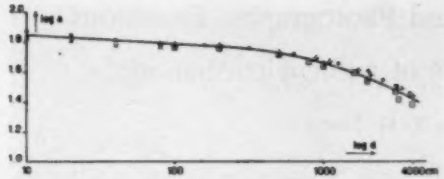


Fig. 1. The ballistically measured current pulse of a photocell during irradiation with an electric discharge flash in relation to the distance d between lamp and cell; both data on logarithmic scale.

During the discharge 100 watt sec. is dissipated in the tube (3Ω) and creates a bluish-white light of 3500 lumen sec. Spectrally, it consists of a continuous background which decreases toward the ultraviolet and infrared and on which some bright mercury and xenon lines are superimposed. The half-life period of the discharge was determined as approximately 1.5×10^{-4} sec. The tube is built into a parabolic reflector of the type used for the headlights of Jeeps. The reproducibility of the instrument proved quite satisfactory.

A high-resistance selenium element of Megatron Ltd., London, of 55 mm diameter served as the photocell. The cell was installed so that gray filters of different densities could be inserted readily without light leaks. The current pulses given by the cell upon irradiation with the light of the discharge were measured ballistically with a Hartmann & Braun Lichtzeiger galvanometer (sensitivity 4×10^{-9} amp per scale division). With this combination the following series of experiments was undertaken:

1. In order to determine the relationship between optical flux density and distance from the flash lamp, readings were obtained for the ballistic galvanometer deflection at various distances (center of spiral to surface of photocell). Figure 1 shows this relationship; both coordinates are drawn on a logarithmic scale. It is surprising that during variations of the distance by 2.5 powers of 10 (from 10 cm to 4000 cm) the ballistic deflection changes only by a factor of 3 (from 70 to 24 scale divisions). This may have two causes. Either the light leaves the lamp almost parallel, or the photocell furnishes at these high illumination intensities, and these brief exposure times, current impulses which are not proportional to the impinging light quantities.

2. In order to decide which of these alternatives was actually involved the energy decrease was determined for a second time by photographic means by exposing a contrasty paper of low sensitivity (Typon PH paper) through a (Zeiss-Ikon) step wedge (as specified in DIN 4512) at different distances from the light source and developing all strips together (for 1.5 min. in a normal metol-hydroquinone developer). The strips proved to be exposed less and less with increasing distance from the light source. The energy decrease could be read immediately on the logarithmic scale of the wedge steps. Because the exposure time always remained the same, the measurements were not influenced by secondary effects, such as the Schwarzschild effect, etc. The results of several experiments which were carried out for large distances with the more sensitive Gevaert cine positive film and linked appropriately to the paper series, are shown in Fig. 2. A comparatively much steeper decrease of the illumination intensity can be noted than in Fig. 1. The experiment thus clearly demonstrates two facts: It shows that the light intensity up to about 1 m distance from the lamp decreases little at first but then to an increasing extent and beyond this distance in almost inverse proportion to the square of the distance (more exactly exponent 1.9) from the light source, (that is as if there were a point light source about 15 cm in front of the spiral). It also is apparent from the experiment that the surprising relationship shown by Fig. 1 is based solely on the properties of the photocell.

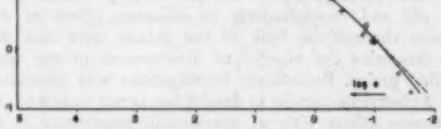


Fig. 3. The ballistically measured current pulse of a photocell during irradiation with an electric discharge flash in relation to its illumination intensity e as in Fig. 2. The greater variations of e are accomplished by addition of gray filters. The signs (x, o, etc.) in Figs. 1-3 refer to different experimental series.

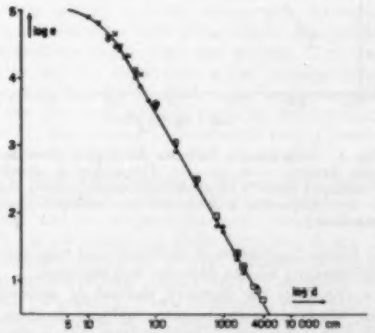


Fig. 2. The illumination intensity e of an electric discharge flash in relation to the distance d between lamp and cell, measured by the photographic effect; both data on logarithmic scale.

3. In order to determine whether there is an area of the photocell in which the photocurrent pulse is proportional to the impinging light quantity during short-time exposures the light pulse had to be decreased to a definite extent and far beyond the decrease previously effected by increasing the distance between cell and light source. For this purpose processed film sheets of definite densities were placed in front of the photocell (light-tight) and the measurements repeated. The ballistic deflections read at certain intervals were plotted on the logarithmic scale against the (relative) illumination intensities as in Fig. 2 for the same distances, with consideration for the inserted gray filters to obtain Fig. 3. The gradient of the curve above 4 powers of the energy increases but very little, but constantly at a higher rate, until it equals one within the 5th and 6th power of the energy; in this region therefore light and current pulses are proportional to each other. It should be mentioned that the smallest ballistic deflections are not very definite but that later by another method the linearity of the cell in this region could be confirmed. After establishing these facts we could unhesitatingly employ the apparatus for measuring the spectral transmittance of different color filters for the radiation of the discharge.

For his kind assistance in the described experiments I should like to express my appreciation to Mr. Beat Meerkamper.

Kinetics of Development of Liquid Photographic Emulsions
I. Development by Derivatives of *p*-Phenylenediamine*

L. J. FORTMILLER AND T. H. JAMES

ABSTRACT

An investigation was undertaken of the kinetics of development of dispersions of silver halide grains in dilute gelatin solutions. The liquid system was used to avoid complications caused by diffusion effects in the coated emulsions. Positive-type emulsion grains were used. After exposure of the dispersion to white light, the course of development was followed by recording continuously the change in optical density to infrared radiation. Detailed investigations were made with two agents, 4-amino-3-methyldiethylaniline, and 4-amino-3-methyl-N-ethyl-N-(β-methylsulfonamidoethyl)aniline. Under the conditions employed, the rate of development followed a first-order equation over most of the course of the reaction. The rate constants varied in direct proportion to the concentration of silver halide grains. They increased with increasing concentration of sulfite, then passed through a maximum, and decreased. They varied as the square root of the concentration of developing agent. They increased with increasing pH, and showed no sign of approaching a maximum up to pH 13.2. The temperature-dependence of development by both compounds followed the Arrhenius equation and gave an apparent energy of activation of 21-22 kilo-calories per mole. Development rates also were determined for 23 derivatives of *p*-phenylenediamine under standard conditions and compared with the rates of development of the coated emulsions. The rate of development of the liquid dispersion was always greater than that of the coated emulsion. The influence of diffusion as a rate-limiting factor in the development of the coated emulsion was particularly evident with the 3-OH, 3-NH_2, and 3-$N(CH_3)_2$ derivatives of 4-aminodiethylaniline and with 9-aminojulolidine.

A STUDY of the kinetics of development of photographic emulsions by hydroquinone[1] and hydroxylamine[2] has yielded information on the mechanism of the development process. In these investigations, it was possible, by suitable choice of pH and concentrations, to minimize effects of diffusion through the bulk of the gelatin layer and thus to determine the kinetics of development of the silver halide grains. Preliminary investigations with derivatives of *p*-phenylenediamine as developing agents indicated that diffusion effects were of considerable importance in the development of coated emulsions by these agents, and hence might mask the kinetics of the chemical reaction. To avoid this difficulty, we have undertaken an investigation of the kinetics of development of dispersions of silver halide grains in dilute gelatin solutions, where the effects of diffusion become relatively unimportant.

Experimental Procedure

An apparatus was constructed with which the course of the development reaction could be followed continuously throughout its entire length. This apparatus consisted essentially of a main reaction chamber of 500-ml capacity connected by rubber tubes to an observation cell. The reaction mixture from the chamber was circulated continuously through the cell by means of a glass magnetic pump which circulated the liquid at a rate of 18 milliliters per second. Both pump and reaction chamber were immersed in a water thermostat. The observation cell was designed† to give nonturbulent flow of the liquid between plane-parallel glass windows which were approximately one millimeter apart. The course of the reaction was followed by continuously recording the optical density of the reaction mixture on a Brown Recorder operated at its highest paper speed of 2 inches per minute. The density was measured by a beam of infrared radiation passing through the cell and impinging upon an RCA 1P22 photoelectric multiplier tube. The light source consisted of a 5A 3-v ribbon-filament tungsten lamp operated at 2.87 volts filtered by a Kodak Wratten No. 89 Filter. Calibration of the multiplier tube was effected by introducing known densities into the beam.

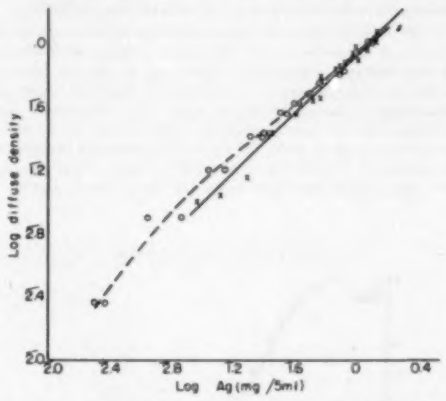


Fig. 1. Relationship between developed silver and its diffuse density: —o—o—o—, Dispersion A developed by 4-amino-N-ethyl-N-(β-methylsulfonamidoethyl) aniline; —x—x—, dispersion B developed by 4-amino-3-methyldiethylaniline.

As a check on the standard method of following the reaction, two other methods were employed. In these, 20-ml aliquots were taken with a syringe from the reaction chamber at various times during development and injected into

† We are indebted to Dr. W. Ruby, of these Laboratories, for the design of the observation cell and the magnetic pump.

*Communication No. 1430 from the Kodak Research Laboratories, Rochester, New York. Received 29 August 1951.

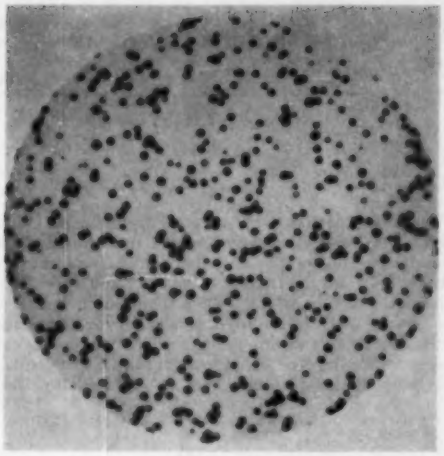


Fig. 2. Photomicrograph of undeveloped grains of emulsion B. The reproduction is at a linear magnification of approximately 1600.

beakers containing 3 milliliters of 50 percent hypo to stop the reaction. Optical density measurements of the silver were made on a portion of each sample (second method) and actual silver determinations were made on the remainder (third method). The density determinations were made on an optical bench, using a movable light source and an observation cell in direct contact with a photronic cell. The density thus obtained is the diffuse optical density of the developed silver suspended in the liquid, since the silver halide has been dissolved out by the hypo.In the silver determinations, sodium sulfite was added to precipitate the gelatin, which carried the silver down with it. The supernatant liquid was removed, and the precipitate washed with decreasing amounts of sulfite solution. The liquid was removed by centrifuging. The silver was dissolved in nitric acid. The solution was then neutralized with ammonia and made slightly acid with acetic acid. An excess of potassium iodide was added, and the excess was determined by amperometric titration with silver nitrate. The precision of this method was better than one percent. If the samples had to be left for more than a few minutes before the initial precipitate was washed, acetic acid was added to lower the pH and prevent physical development. The amount of silver proved to be roughly proportional to the fixed-out density (see Figure 1).

Two different emulsions were used in preparing samples for the development tests. Both were relatively simple emulsions, and the preparations were carried out normally through the after-ripening stage. Emulsion **A** was a fine-grain motion-picture positive type. Emulsion **B** was a high-contrast motion-picture positive type of relatively uniform grain size (Figure 2). Stock dispersions were prepared by dissolving 60 grams of set emulsion **A** in 330 milliliters of 0.3 percent gelatin solution at 40 C and 50 grams of emulsion **B** in 225 milliliters of distilled water at 40 C. The resulting dispersions were then cooled at 20 C.

The development tests were made in the following manner: Seventy-five grams of stock **A** was added to 325 milliliters of 0.5 percent gelatin solution or 60 grams of stock **B** was added to 290 milliliters of 0.5 percent gelatin solution, and the resulting dispersion was brought to temperature (20 C unless otherwise specified) in the reaction chamber. The buffer solution (50 ml) was then added, and nitrogen was kept bubbling through the liquid. The dispersion was now circulated through the observation cell by means of the magnetic pump, and it was exposed to light from the tungsten source with the Wratten No. 89 Filter removed from the light beam for 15 minutes (emulsion **A**) or for 6 or 18 minutes (emulsion **B**). A solution of sodium sulfite in 50 milliliters of water was then added and, 3 minutes later, a solution of the developing agent in 50 milliliters of acid bromide solution was added from a hypodermic syringe to insure rapid mixing. The acid bromide solution consisted of 0.008 *M* hydrochloric acid plus potassium bromide, and the developer solution was adjusted to temperature before addition. The buffer solution for pH 9 contained borax; for pH 10 and pH 11, a mixture of sodium carbonate and potassium bicarbonate; for pH 12, trisodium phosphate; and for pH 13, potassium hydroxide. The "standard" reaction mixture contained 5.2 grams of sodium sulfite, 0.00075 mole of developing agent, and 0.002 mole of potassium bromide at pH 10. The

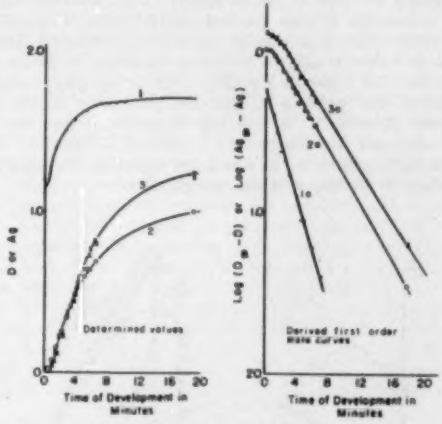

D or Ag
Determined values
Time of Development in Minutes
Log (D∞ − D) or Log (Ag∞ − Ag)
Derived first order Mate curves
Time of Development in Minutes

Fig. 3. Liquid dispersion A developed by 4-amino-N-ethyl-N-(β-methylsulfonamidoethyl)aniline at pH 10. Curve 1, density of silver plus silver halide; Curve 2, diffuse density of developed silver; Curve 3, mass of developed silver; Curve 1a, log($D_\infty - D_t$); Curve 2a, log($D_\infty - D_t$); Curve 3a, log($Ag_\infty - Ag_t$).

pump supplied adequate agitation, as no increase in development rate was observed when auxiliary stirring was employed.

Results

Preliminary experiments were carried out to determine the dependence of the rate of development of the dispersion upon the amount of white-light exposure. With both emulsions, the rate increased with increasing exposure for short times, then reached a maximum, and showed no further significant change. With dispersion **A**, no signifi-

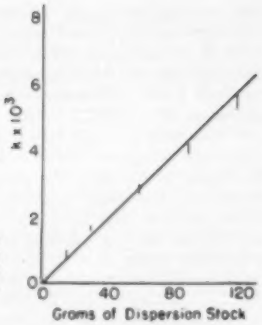


Fig. 5. Effect of silver halide concentration upon the rate at which 4-amino-3-methyldiethylaniline develops dispersion B.

cant variation in development rate occurred for exposures between 3 and 30 minutes, and 15 minutes was chosen as the standard exposure for most of the work with dispersion B.

Typical curves showing the progress of development are given in Figures 3 and 4. In these figures, Curve 1 represents the increase in density of the silver-silver halide mixture as a function of time of development (first method). Curve 2 is a plot of diffuse density of the fixed-out silver as a function of time (second method), and Curve 3 is a similar plot of developed silver (third method). These curves follow roughly a first-order equation, as shown by the fact that a plot of log $(D_\infty - D_t)$ or log $(Ag_\infty - Ag_t)$ against time yields a straight line over most of the reaction (Curves 1a, 2a, and 3a). Accordingly, the rates of development are conveniently expressed in terms of the first-order constants, k, which are equal to the absolute values of the slopes of the straight lines.

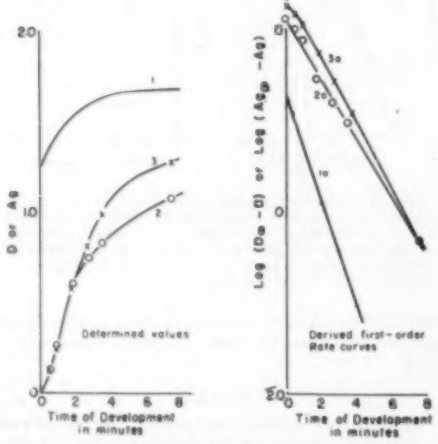


Fig. 4. Liquid dispersion B developed by 4-amino-3-methyldiethylaniline at pH 10.0. Curve 1, density of silver plus halide; Curve 2, diffuse density of developed silver; Curve 3, mass of silver; Curve 1a, log$(D_\infty - D_t)$; Curve 2a, log$(D_\infty - D_t)$; Curve 3a, log$(Ag_\infty - Ag_t)$.

Table I

EFFECT OF DEVELOPER CONCENTRATION

Dev. Conc., C	k	C^1	$100\ k/C^1$
0.00075	0.0018	0.027	6.6
.0015	.0026	.039	6.7
.0030	.0039	.055	7.1
.0053	.0051	.073	7.0
.0068	.0055	.083	6.7

The first-order constants obtained from Curves 2a and 3a are roughly equal. Those obtained from Curves 1a are considerably higher, because the densities measured by Method (1) are the composite of silver and silver halide densities. The value of $D_\infty - D_t$ at zero time is smaller for the unfixed than for the fixed dispersion, and the increase in density relative to this value is greater during the early stages of development. Hence, the first-order rate constants are greater when determined for the unfixed dispersions.

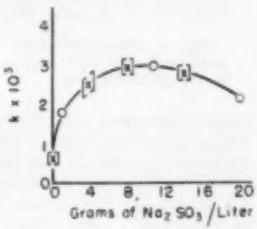


Fig. 6. Effect of varying the sulfite concentration upon the rate of development of liquid dispersion B by 4-amino-3-methyldiethylaniline.

Such constants, however, are suitable for comparisons of relative development rates and their dependence upon the composition and temperature of the developing solution, and will be used in the subsequent discussion unless otherwise specified.

The development-rate constant varies approximately in direct proportion to the "concentration" of silver halide grains. This is illustrated by the plot shown in Figure 5, of rate against grams of dispersion stock.

The length of the vertical line representing each determination represents the uncertainty in the calculation of k. In these experiments, the volume of the reaction mixture was kept constant by adjusting the amount of gelatin solution to compensate for the different volumes of stock dispersion employed. Below approximately 50 grams of dispersion stock, the developing agent (0.00075 mole) is in excess; above this, the silver halide is in excess.

The rate of development passes through a maximum as the concentration of sodium sulfite is increased. This is illustrated by Figure 6, in which the rate constant is plotted against the amount of sulfite per liter of reaction mixture. The amount of sulfite chosen for the standard reaction mixture (10.4 g) corresponds to that producing the maximum development rate.

The rate of development varies as the square root of the concentration of the developing agent. This is shown in Table I for dispersion B developed by 4-amino-3-methyldiethylaniline. The ratio, k/C^1, given in Column 4, is satisfactorily constant.

The rate of development increases with increasing pH, and decreases with increasing bromide ion concentration. These results are shown in Tables II and III.

Table II

EFFECT OF pH

pH	$3 + \log k$
9.0	0.12
10.0	.47
11.2	.66
12.3+	1.04
13.1+	1.70

The effect of temperature upon the rate of development is shown by the Arrhenius plot in Figure 7. Two developing agents are represented, 4-amino-3-methyldiethylaniline (II) and 4-amino-3-methyl-N-ethyl-N-(β-methylsulfonamidoethyl)aniline (III). The values plotted are $\ln k$ as a function of the reciprocal of the absolute temperature. These values lie on straight lines. The slopes of the two lines are nearly equal, and give the apparent activation energies

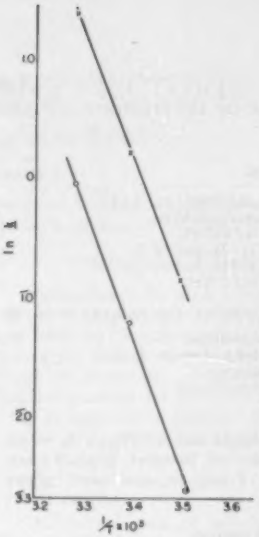


Fig. 7. Relation between the natural logarithm of the development rate of liquid dispersion B and the absolute temperature: —x—x—, Development by 4-amino-3-methyldiethylaniline; —o—o—, development by 4-amino-3-methyl-N-ethyl-N-(β-methylsulfonamidoethyl)aniline.

Table III

EFFECT OF POTASSIUM BROMIDE

Millimoles of KBr added per Liter	k
0	0.0069
1.0—	.0060
4.0	.0047
16.0	.0028

of 21.3 and 22.0 kilocalories per mole. These values have not been corrected for the slight dependence of pH upon the temperature for the carbonate buffer used. The temperature coefficients are about 3.5 per 10 C.

The rate of development of despersion **A** at pH 10.0 was determined for several derivatives of 4-amino-N,N-diethylaniline and related compounds, using the standard developer formula. Rate determinations were also made using the commercial coated emulsion **A** and the same developer formula. The apparatus and procedure for development of the coated emulsion have been described previously.[3] The first-order constants for development of both the dispersion and the coated emulsion are given in Tables IV and V, together with the polarographic half-wave potentials (Lewis and Randall convention) for the developing agents in the absence of sulfite, as determined by Julian and Ruby.[4] Good first-order constants were obtained for all of these compounds except Nos. 2, 11, 23, 26, and 34. The constants listed for the latter compounds were determined either from a straight line which represented a substantial portion of the data or the best straight line which could be drawn through the data points.

In Figure 8 the logarithms of the rate constants for the dispersion are plotted against those for the coated emulsion. All but a few of the points fall reasonably close to the line. Compounds 12 and 13 gave relatively low rates of development of the dispersion. At the high rate of development end of the curve, several compounds appear which give about the same rate of development of the coated film, but widely different rates of development of the dispersion. The rate constants for development of the dispersion are all higher than the corresponding rate constants for development of the coated emulsion. The ratio is fairly constant for several of the developing agents, as

Table IV

RATES OF DEVELOPMENT OF EMULSION A BY RING-SUBSTITUTED 4-AMINODIETHYLANILINES

Number Assigned to Developing Agent	Ring Substituent	k (Sec.) for Liquid Dispersions	k (Sec.) for Coated Film	Half-Wave Potential in Mv. *vs.* S.C.E.
1	3-OH	$\geq$ 0.23	0.0010+	+266.
2	3-NH_2	.098	.0015	+145. estimated
3	3-$NHSO_2CH_3$	.059		
4	3-$N(CH_3)_2$	.040	.0010+	+ 92. estimated
5	3,5-di CH_3	.026	.00062	+ 43.
6	3-OC_2H_5	.023	.00083	+ 59.
7	3-CH_3	.0114	.00053	+ 17.
8	None	.0072	.00028	— 20.
9	3-$C_6H_4NHSO_2CH_3$	.0065	.00030	+ 12.
10	3-CH_2OH	.0051		— 17.
11	3-Cl	.0013	.000028	— 77.
12	3-$NHCOCH_3$	.0012	.00023	— 26.
13	6-OCH_3, 3-CH_3	.00044	.000045	— 24.

Table V

RATES OF DEVELOPMENT OF EMULSION A BY 4-AMINO-R_1,R_2-ANILINES

Number Assigned to Developing Agent	R_1, R_2	k (Sec.) for Liquid Dispersions	k (Sec.) for Coated Film	Half-Wave Potential in Mv. *vs.* S.C.E.
21	C_6H_5, $C_6H_4NHSO_2CH_3$, 3-CH_3	0.0049		
22	C_6H_5, $C_6H_4NHSO_2CH_3$	.0044		
23	C_6H_5, $CH_2CH_2NH_2$	.0044	0.00024	
24	C_6H_5, $CH_2CH_2NHCOCH_3$	.0033	.000095	
25	C_6H_5, $CH_2CH_2OC_2H_5$	.0028	.00011	
26	C_6H_5, CH_2CONH_2	.00075	.000016	
	RATES OF DEVELOPMENT OF EMULSION A BY OTHER DERIVATIVES OF *p*-PHENYLENEDIAMINE			
31	9-Aminojulolidine	(0.06)	0.0010+	+73.
32	*s*-Dimethyl-*p*-phenylenediamine	.027	.0010	+77.
33	Diaminodurene	.016		+60.
34	*p*-Phenylenediamine	.00022		+75.

indicated by the broken straight line of Figure 8, which represents a ratio of 25. The ratio, however, is much lower than this for compounds 12 and 13, and much higher for 1 and 2.

Discussion

Comparison of the data for development of the liquid dispersions with the existing data for development of the coated emulsions brings out several points of similarity and contrast. The rate of development of both the liquid dispersion and the coated emulsion[2] increases at first with increasing concentration of sulfite, but eventually reaches a maximum and, at high sulfite concentrations, begins to decrease. The mechanism of the increase produced by the sulfite has been discussed in a previous paper.[5]

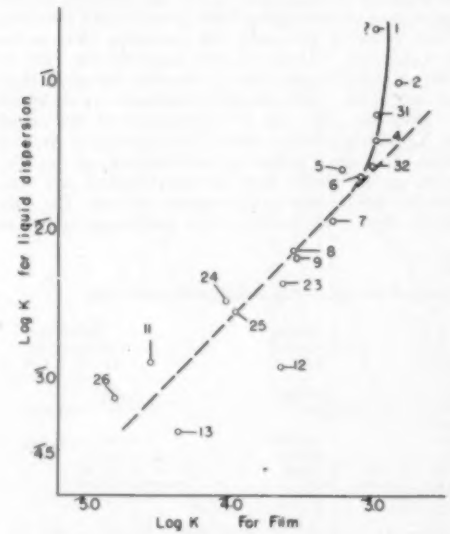


Fig. 8. Comparison of development rates for liquid dispersion and coated emulsion A at pH 10 with developers listed in Tables IV and V.

The decrease in rate beyond the maximum probably is a result of nucleus isolation and a relative increase in the amount of physical development.[5]

The rate of development increases continuously with increasing pH in the liquid suspension, and shows no sign of approaching a maximum up to the highest pH value tested (13.1). The rate of development of the coated emulsion, on the other hand, approaches a maximum.[3] This suggests that the diffusion is becoming a limiting factor in the development of the coated emulsion at high pH.

The influence of diffusion as a limiting factor in the rate of development of the coated emulsions is particularly evident among a group of four rapid developing agents tested (compounds 1,2,4,31). The rate of development of the coated emulsion within this group varies only between 0.0010 and 0.0015, whereas the rate of development of the liquid dispersion varies by more than 8-fold. The rate values for the liquid dispersion give a much more accurate indication of the effect of structure of the developing agent upon the rate of the chemical reaction.

The rate of development of the dispersion varies with the square root of the concentration of the developing agent, other things remaining constant. The same dependence was found[1] between the rate of development of coated emulsions by hydroquinone and the concentration of the hydroquinone under conditions where diffusion effects were minimized. This type of relation indicates that the developing agent becomes adsorbed prior to the chemical reaction.

The temperature coefficient of development of the dispersion by compounds II and III is substantially the same, even though the relative rates of development vary by 4-fold. Both compounds give data which yield satisfactory Arrhenius plots. The apparent energy of activation of the development process is 21-22 kilocalories per mole for the two agents. This value is much higher than that to be expected from a diffusion-controlled process (4-6 kcal/mole).

Bibliography

1. T. H. James, J. Phys. Chem., Vol. 44, p. 42 (1940).
2. T. H. James, J. Phys. Chem., Vol. 47, p. 597 (1943).
3. T. H. James, PSA Journal, Vol. 16B, p. 83 (1950).
4. D. Julian and W. Ruby, Private communication.
5. T. H. James, J. Colloid Science, Vol. 4, p. 561 (1949).

MAKING "IN-PLANT" PICTURES

J. W. McFarlane and G. Eaton*

IN-PLANT picture taking differs from picture taking for promotional purposes in several important respects. The good promotion photograph says, "This is something you want, isn't it?" The good in-plant picture says, "Here is the information you want." The good promotional picture requires artistic skill, professional equipment, and considerable time to make. Several hours and sometimes days are consumed in making one picture. The object is shown at its best, or may even be glamorized. The lighting is striking and effective. Texture and shape are rendered beautifully,

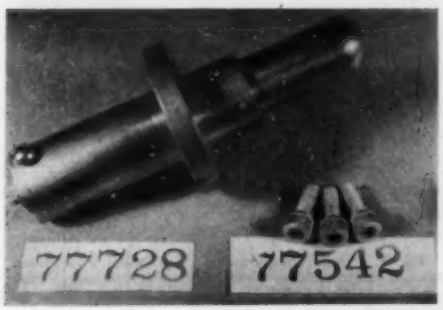


Fig. 1. Record picture of small machine parts with identification numbers introduced by rubber stamped labels.

the perspective is pleasing, and various background effects may be introduced to further the general idea; the print is usually dodged and possibly remade several times. The print is also spotted carefully, and usually art work is added. The promotional picture is costly, and worth it.

The requirements of an in-plant picture, on the other hand are merely that it is clear, sharp, distinct and that it conveys the information concerned. Such picture taking does not require highly technical work. This type of picture is generally made very quickly, as it is often just one item of perhaps hundreds photographed in a few hours or a day. The lighting is usually from the front, provided that front lighting is sufficient to bring out the facts that are wanted. Texture, shape, and perspective are usually of little importance. Some idea of size is wanted, so a measuring scale is often included. A part identification number may also be included. Prints are usually small, and neither dodged nor spotted. They are frequently made by commercial photofinishing methods.

The quality level must, of course, satisfy the person for whom the picture is made. An engineer on the job, making his own photographs, may be satisfied with rather indifferent prints. On the other hand, he rightfully expects a more workmanlike job from the plant photographer or from a commercial photographer called in for the purpose.

Selection of Camera Equipment

The camera to be used depends on a number of factors, the more important of which are: (1) Must the camera be taken to the subject, or (2) is it more convenient to bring the subject to the camera? Buildings, plant areas, large machines, etc. obviously fall in the first class. A picture showing the arrangement of tools on a turret lathe may be required to expedite the duplication of this particular tool setup. A hand-held camera with attached flash or front light is usually indicated. The negative sizes may range from 24x36mm to 4x5 inches, depending on other considerations.

The second class of subject is represented by small parts which are conveniently brought to a bench-camera installation (Figure 1). A small camera on a stand or an adapted enlarger can be used for the purpose. Most small parts have very little pertinent detail and can often be photographed satisfactorily on 35mm film. Some of the parts concerned are quite small so that the field size may be an inch wide, or even much less. (Figure 2). An interchangeable type of outfit with long bellows is indicated for such work. .

Fig. 9. Camera and light on improvised four-legged stand. The leg tips are made to come just outside the corners of the area photographed. This area is thus defined to avoid viewing the ground glass image.

* Sales Service Department, Eastman Kodak Company, Rochester, New York. Continued from "The Photographer in Industry" in the September 1951 issue. Received 5 July, 1951.

Fig. 2. Wires photographed to show difference in soldering for training workers on a defense production project. Extreme closeups like this are sometimes required of the in-plant photographer.

Identification of Small Parts

Because of the nature of some of the material photographed and the limited use to be made of the photographs some in-plant pictures represent, of necessity, an all-time low in pictorial rendering. A large lot of machine tools was photographed, for example, for government purposes, without removing their heavy coating of dark-colored preserving grease. The government officials labeled the set-ups with identification data marked on cards with crayon. The resulting pictures were naturally quite rough but were satisfactory for the intended purpose, which was to establish a record before disposing of the tools.

The identifying number in Figure 1 has been made by a rubber stamp and presents a neater appearance than the usual hand-lettered number. Rubber stamps are probably the best compromise between the high cost and slow preparation of typeset numbers and the careless and poorly legible appearance of handwritten ones. These number stamps are available in several digits and in a number of sizes. A sans-serif type, that is, one without thin lines or sharp points, is preferable for photographic purposes.

Figure 3 shows a method of including size identification without use of a measuring scale. The background board is marked off in inches and the parts to be photographed are laid successively alongside the measuring marks. A board of this type is shown in use in Figure 8. The tool identification number was letterpress printed in Figure 3 and included on a card. The photographic print included a typewritten description of the tool which was added to the print by a typewritten stencil cut on Remington Rand Stenalith paper. This tool picture was part of a large group of such pictures which were supplied in lieu of drawings originally requested by a prime contractor. The pictures were entirely acceptable for the purpose and much cheaper to make than drawings.

A still more highly developed method of including identification data is shown in Figure 4. The group of parts was photographed on an illuminator. The numbers in circles were positives made on a high-contrast film. The additional data in the corner were included in the same way. It is interesting to note that the spatial relationship between parts is shown by their positions on the illuminator, and yet the view is not a full, three-dimensional, exploded one. Numerical data can also be added by the use of separate small cards, each bearing a number or letter. There are occasions when this method is more convenient than others; for example, when the designating number is too complex, or too long for the rubber-stamp method.

Fig. 3. Tools photographed on a board background marked in inches. Tool number set up in type and proofed on a card. Type-written legend was added to the print by contact printing from a stencil.

Fig. 5. Small photographic prints used in sequence for instructional purposes. Note the large size of detail and the use of cardboard arrows.

Close-up Pictures

Close-up photographs are of interest in reports and are frequently much more meaningful than mere descriptions. The picture should usually be taken at some angle less than vertical, to provide a better idea of the shape of the tool. When taken from directly above, the vertical dimension is lost. Specific details can be pointed out by including in the picture a cardboard pointer or an arrow.

The economy of in-plant pictures is greatly offset if extensive art work is needed on the print. For this reason, it is desirable to include necessary symbols, arrows, etc., in the picture. When pictures can be made and reproduced economically enough, large numbers of them can be used in other booklets. Figure 5 shows a page from a book on bicycle repair which was presented almost entirely in pictures. Figure 6 shows small photographic prints used on an instruction card for a line-inspection routine. It should be noticed that, because the field of view in each picture is quite small, the detail is large, and therefore a small print size is practical.

Fig. 7. Lights, 35mm camera, and improvised focal plane used to photograph hand operations from close-to-the-eye-point of the operator.

Some testing, experimental, or research work calls for a series of photographs of a fixed field made at various times. In such cases, it is convenient for all concerned if the photographer can set up a simple, fixed, photographic arrangement, possibly using a roll-film camera, so that the man who wants the pictures can take them without delay whenever required.

The form of the finished print should be the subject of considerable thought. In some cases, a pocket-size book of prints is the best format. In other cases, 8x10 or 8½x11 inch prints bound, in a book, are most useful. The photographer should learn as much as he can about the intended use of the pictures and should provide prints accordingly.

Job Instruction Pictures

Pictures are frequently made for job instruction of employees. This is especially true in an expanding plant or in a plant undertaking many varied types of work. One of the requirements of instruction pictures is that they be made from an observation point close to the eyes of the worker. Pictures made from across the table are difficult to interpret in terms of what the worker sees. Figure 7 shows a 35mm camera with lights and an improvised

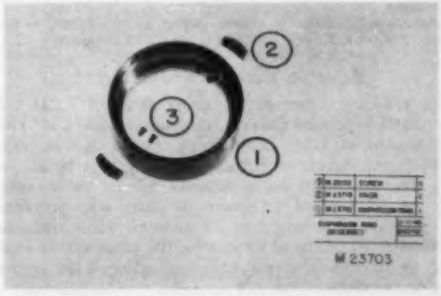


Fig. 4. Parts picture with professional looking caption. Engineering drawings of the legends were photographed then positives were made on process film. The parts and positive legend were photographed while lying on a transparency illuminator.

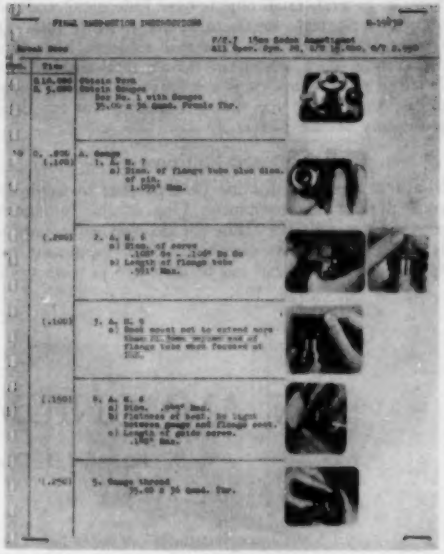


Fig. 6. Small prints of sequential inspection steps mounted on an inspection procedure card.

focal frame used in photographing an assembly operation. The resulting picture shows the worker's hands in a natural perspective.

Another important point in training pictures is that the first picture or pictures in the series should acquaint the trainee with whatever is supplied to him and what he is supposed to end up with. Intermediate pictures can show the steps necessary to produce the end result.

The amount of detail desired is the basic consideration in determining the minimum negative size that will be satis-

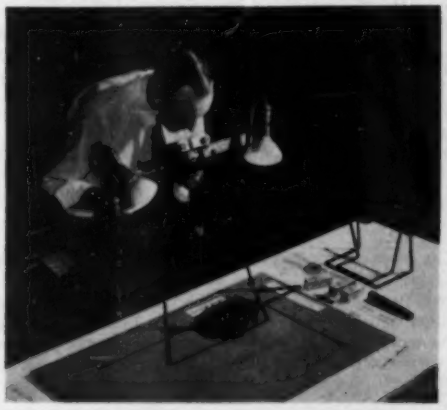


Fig. 8. Lights, 35mm camera, and focal frame used for rapid photography of tools and parts.

factory. In general, small objects have little detail and will therefore photograph satisfactorily on a small film. On the other hand, it is also true that subjects, like ships' anchors, have much less detail than a disassembled view of a lady's wrist watch. It is a mistake to attempt photographing with a film size that is too small for the detail requirements of the picture.

Improvised Equipment

It will be necessary for the photographer to improvise a good deal of his equipment. One of the commonest improvisations is a focal frame for close-up work, particularly with miniature cameras. A light unit supporting two lamps on a horizontal bar can be added to provide (as in Figure 8) a convenient and rapid method of small-object photography. It may also be necessary to improvise a stand for vertical photography, in which case the tips of the stand's legs, as in Figure 9, can be made to define the corners of the areas photographed.

Color photography is useful in dealing with such subjects as electronic devices, where resistors, capacitors, and other units are color-coded. There are other industrial applications where color is used in a functional manner, as in installations where piped lines are color-coded or where various machine parts are colored functionally. In general, color photographs can be successfully made using the same equipment that is described for black-and-white photography.

AN AMMONIUM HYPO REDUCER*

R. W. Henn, J. I. Crabtree, and H. D. Russell

SUMMARY

An ammonium thiosulfate fixing bath with the acidity increased by means of citric acid forms a useful reducer. This bath acts (1) to remove silver and silver sulfide stains, and (2) to proportionally reduce the silver image. It is applicable to a wide range of materials and produces a minimum of weak image detail. Alternative formulas are described.

The ability of thiosulfates to dissolve slowly the silver of the developed photographic image, as well as the undeveloped silver halides, is well known[1]. Many photographers have had the experience of seeing prints that have been left for an excessive period in the fixing bath greatly reduced in density. Ammonium thiosulfate, which is characteristically employed in the currently popular concentrated, rapid, liquid fixing baths, has a stronger reducing action than sodium thiosulfate, and the manufacturers of these fixers warn against prolonged fixing times, particularly with prints. The reducing action of the thiosulfates is made more rapid by raising the temperature or by increasing the acidity. By taking advantage of this last property, very useful reducers can be compounded which act (1) selectively to dissolve finely dispersed, dichroic silver, characteristic of many stains, and (2) then slowly and proportionately to reduce the image. This results in a uniform reduction in contrast without loss of shadow detail. The rest of this paper will be confined to a description of the properties of this type of reducer.

Formulas

The formulas for several alternative reducers are given in Table I. These comprise acid hardening ammonium thiosulfate fixing baths, with the acidity increased by the addition of citric acid. The ammonium thiosulfate is the active reducing agent, while the other ingredients produce the correct degree of acidity without causing sulfurization of the hypo, and allow hardening to continue so that supplementary hardening is not required as with so many other reducers. The use of a quality-controlled prepared fixing bath as a basis is convenient in that this bath may already be in the photographer's possession.

TABLE I

REDUCER FORMULAS
Per Liter of Diluted Reducer

Basic Solutions	Stock Hypo	Hardener	Citric Acid	pH
1. Kodafix	330 cc.	- -	(a) 15 grams	4.10
			(b) 30 grams	3.55
2. Kodak Rapid Liquid Fixer with Hardener	250 cc.	30 cc.	(a) 15 grams	3.66
			(b) 30 grams	3.2
3. Ammonium Thiosulfate + Kodak F-5a	150 grams	200 cc.	(a) 15 grams	3.4
			(b) 30 grams	3.1

Relative Rate of Reduction

The reducing action of the fixing baths of Table I is determined largely by the concentration of citric acid. This is illustrated in Table II, where it is seen that in order to reduce the density of Kodak Super-XX Film by 20 per cent, the unacidified baths required 38 to 50 minutes; with the addition of 15 grams of citric acid per liter, the times varied from 15 to 22 minutes, while with the addition of 30 grams of citric acid, the times varied from 10 to 13 minutes. The relative rate of action is similar for other applications.

Proportionality of Reduction

The proportional action of the hypo reducer is well illustrated by Figure 1, in which strips of Kodak Plus-X

* Communication No. 1423 from the Kodak Research Laboratories, Rochester, New York. Received 1 August, 1951.

TABLE II

RATE OF REDUCTION
(Kodak Super-XX Sheet Film)

Reducer No.	Basis	Citric Acid (Grams per Liter)	Time for Reduction of 20% in Density (Min.)
1	Kodafix	0	50
1 (a)	Kodafix	15	22
1 (b)	Kodafix	30	13
2	Kodak Rapid Liquid Fixer	0	40
2 (a)	Kodak Rapid Liquid Fixer	15	17
2 (b)	Kodak Rapid Liquid Fixer	30	12
3	Ammonium thiosulfate + Kodak F-5a	0	38
3 (a)	Ammonium thiosulfate + Kodak F-5a	15	15
3 (b)	Ammonium thiosulfate + Kodak F-5a	30	10

35 mm Film have been subjected to a series of reducing times. The resulting group of characteristic curves is very like a time-of-development series obtained in an unbromided developer such as Kodak D-76. Note the small loss of shadow detail, as shown by the nearly constant location of the speed point.

Quite similar results have been obtained with a range of emulsions, varying from the high-speed Kodak Tri-X Film to the extremely fine grain, high-resolving-power Kodak Type 548 Plates. The times of reduction will of course vary with the emulsion, and an idea of the magnitude of the variations is given in Table III. Loss of toe is found, however, with the finest-grained materials, particularly on strong reduction.

The hypo reducer is capable of compensating, when necessary, for a very great degree of overdevelopment. For example, similarly exposed rolls of Plus-X Film were developed (a) in Kodak D-76, and (b) in Kodak D-11 for 15 minutes. In the latter case, the resulting negatives were so dense that the image was visible only when viewed with intense illumination. Yet following prolonged reduction, this roll was printed on the same grade of paper and with approximately the same times as the properly developed roll.

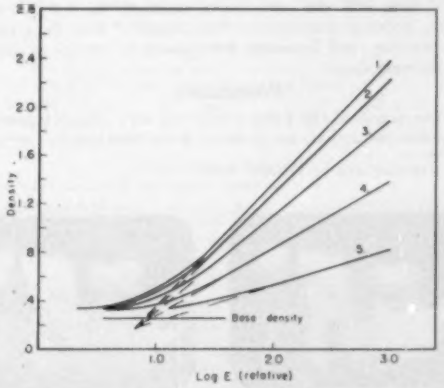


Fig. 1. Characteristic curves obtained by a series of increasing times of reduction. The reducer variation 2 (b), containing 30 grams of citric acid per liter, was employed for 0, 4, 8, 16, and 32 minutes at 68 F. Note the resemblance to the usual time-of-development series. Kodak Plus-X 35mm Film, developed in Kodak DK-60a for 7 minutes at 68 F.

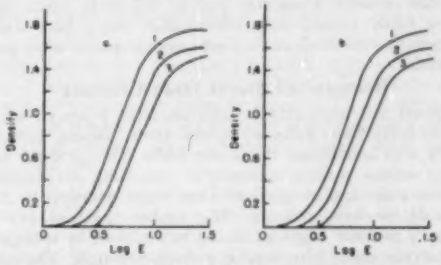


Fig. 2. Characteristic curves of paper emulsions reduced in the ammonium hypo reducer. Figure a is for Kodak Royal Bromide Paper, Grade F-3, unreduced (1) and treated for 4 minutes (2) and 8 minutes (3) at 68 F. Figure b is for Kodak Velox Paper, Grade F-3, reduced for 0, 2, and 4 minutes. Reducer variation 2 (a), containing 15 grams of citric acid per liter.

Use with Papers

The action of the reducer containing 15 grams of citric acid per liter on (1) a high-speed bromide paper, and (2) a "contact-speed" chloride paper is shown in Figure 2. A slight loss or clearing out of the toe region of the curve occurs, and the loss of the shoulder region becomes serious on extended times, but the chief effect is to correct for overexposure or overdevelopment, and this reducer may be used for such correction. Times up to 6 minutes are suitable for Kodak Royal Bromide and up to 2 minutes for Kodak Velox, and intermediate times are applicable to medium-grain papers such as Kodabromide. The effect of this reducer will be (1) to reduce density so as to compensate for overexposure or overdevelopment, and (2) to increase contrast somewhat (reduce log exposure scale), particularly noticeable in the highlights, and (3) to cause a shift in the image tone with some papers. The reduction in maximum density is not readily visible unless reduction is prolonged.

Removal of Silver Stains

Stains of silver and silver sulfide occur very frequently in photography.[2] They may form in the developer, when it is contaminated with hypo or sulfide, and in the fixer

if rinsing, acidity, or agitation are insufficient. They may be yellow, brown, metallic, or a hazy gray by reflected light and are yellow, red, purple, or gray to transmitted light.

Silver and silver sulfide stains are slowly removed by a dilute cyanide solution and more rapidly by dilute ferricyanide-hypo baths, but at the expense of some image density. The hypo reducers, however, quite rapidly remove the stain and, with negative materials, cause no detectable loss of image density or shadow detail. The variation employed for this purpose is the one containing 15 grams of citric acid per liter. The material is immersed in this bath and the stained area swabbed with cotton. Action is often complete in 2 minutes but may occasionally require 5 minutes or more.

This reducer has proved extremely valuable in the trade. In one instance, a machine load of roll films, which had been badly spotted with silver-sulfide fixing bath stain, was fully recovered and entirely normal prints were produced.

Removal of Stains from Clothing

Silver and silver sulfide stains are often produced when silver-laden hypo baths are spilled upon clothing, particularly with ammonium thiosulfate baths. This problem has been serious in some radiographic processing installations. These stains can be removed from white garments by the use of the hypo reducers. The weaker variation (a) is usually suitable. Light stains can be removed by sponging but dense stains may require soaking overnight. The garment is then rinsed in cold water, after which it may be given the regular laundering procedure. The bath may bleach some dyes and it is not recommended, therefore, for colored garments.

Color Films Given Black-and-White Processing

Occasionally, through error, color films are given regular negative processing rather than the usual reversal processing. In such a case, the photographer usually finds himself with a quite weak negative image and an intense yellow-orange stain. Such negatives can be contact-printed on bromide paper, or the stain can be removed by the use of the hypo reducer, employing the variation with the higher citric acid content. This may require from 5 to as much as 20 minutes, depending on the intensity of the stain. It is best to leave the last traces of stain in the film, provided it is uniform, or loss of shadow detail may occur.

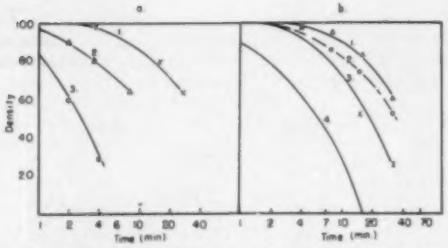


Fig. 4. Illustrating degree of reduction achieved with various films and papers, using the hypo reducer (a) with 15 grams of citric acid per liter, and (b) with 30 grams of citric acid per liter. This figure serves as a guide to aid in attaining the desired degree of reduction. *a.* 1. Kodak Plus-X Film; 2. Kodak Royal Bromide Paper; 3. Kodak Velox Paper. *b.* 1. Kodak Tri-X Film; 2. Kodak Super-XX Film; 3. Kodak Plus-X Film; 4. Kodak High Resolving Power Plates, Type 548.

Comparison with Other Reducers

The reducing action of the acidified ammonium hypo baths is more nearly proportional than that of any other reducer investigated. Figure 3 illustrates the usefulness of this solution in reducing overexposed Kodak Dental X-Ray Films. This operation is performed by roentgenologists who desire matching films from the whole mouth, but the overexposure is usually less extreme than the example shown. Note the retention of detail around the roots of the teeth as compared with the losses obtained with Farmer's reducer (Kodak R-4b). The Belitzski (Kodak R-8) reducer also caused some loss in detail.

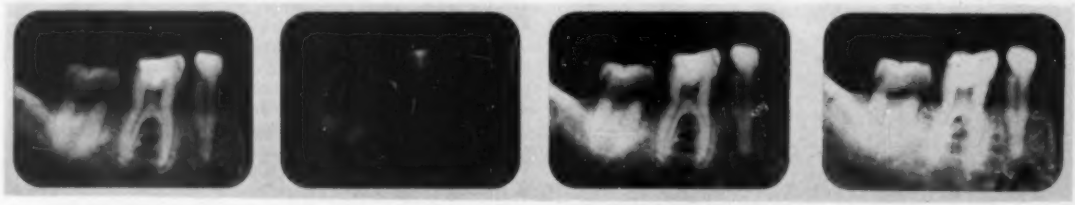
Keeping Properties

The addition of the citric acid will slowly cause sulfurization of the hypo, the time of sulfurization varying with the quantity of citric acid employed and with the temperature. The safekeeping time may vary from as little as 2 days with the most active variations to 4 weeks or more. Reducers compounded from Kodafix* have the greatest stability, and have not precipitated in storage periods of 8 weeks.

Precautions

The action of the hypo reducers is very straightforward and few precautions are required. Reduction may be carried

* Manufactured by Eastman Kodak Co.



a b c d

Fig. 3. A series of dental radiographs showing the ability of the hypo reducer to act without loss of delicate detail. Figure a shows a normally exposed radiograph, Figure b represents 3X normal exposure. In Figure c, the overexposed film has been reduced with variation 2 (b), containing 30 grams of citric acid per liter, for 15 minutes. In Figure d, the so-called proportional form of Farmer's reducer has been employed. Note the loss of detail in the roots and crown.

TABLE III

REDUCING RATE VERSUS EMULSION

Reducer Variation 2b

Emulsion	Unreduced Gamma	Unreduced Density	Reduced (Min.)	Reduced Gamma	Reduced Density	% Reduction
Kodak Tri-X Aero Film	1.8	2.0	16	1.5	1.6	18
			32	1.2	1.0	40
Kodak Plus-X 35mm Film	1.05	1.6	8	0.8	1.3	25
			16	0.58	0.96	45
Kodak High Resolving Power Plates, Type 548-GH	3.2	2.0	2	2.4	1.4	30

out in daylight and be readily followed, since the solutions are not colored. The data of this paper were largely, but not exclusively, obtained with strong agitation, but the degree of agitation employed is not particularly important, except as it affects the time required. Probably the only appreciable inconvenience in the use of these reducers is the odor of the sulfur dioxide evolved, particularly in the case of the most acid variations. Sulfur dioxide is evolved from all acid fixing baths, but in this case the quantities are unusually intense. The gas is unpleasant, and toxic in high concentrations, but the penetrating quality of the odor makes the breathing of large quantities improbable. Sulfur dioxide can also affect sensitized materials. Reduction should therefore be carried out in a well-ventilated room and away from sensitized materials. Deep vessels, such as tanks, beakers, and cylinders, will give off less gas than shallow layers in trays. This reducer will, like other fixing baths, attack ordinary stainless steel (Type 302) on prolonged contact, particularly in the vapor phase.

Practical Recommendations

While any of the alternative baths of Table I are suitable, preference is given to Formula No. 1, employing Kodafix, because of the simplicity of mixing and the stability of the resulting reducers. The two variations comprise:

(a) Normal Reducer

(For use in removing silver stains and dichroic fog and for reduction of papers and fine-grained films.)

Kodafix (stock)	11 oz.	330 cc.
Water	22 oz.	670 cc.
Kodak Citric Acid	½ oz.	15 grams

(b) Strong Reducer

(For reduction of negative materials.)

Kodafix (stock)	11 oz.	330 cc.
Water	22 oz.	670 cc.
Kodak Citric Acid	1 oz.	30 grams

General Procedures

Work in a well-ventilated room away from sensitized materials. Clean the negative or print, freeing it from grease with Kodak Film Cleaner if it has received much handling. The film may be pre-wet (for example, in Kodak Photo-Flo, diluted 1:200) to ensure uniformity, or, if the reducing action is to be slow, the film is immersed directly in the reducer.

(1) *Removal of Silver Stains and Dichroic Fog.* Use variation (a), the weak reducer. Immerse the film or print in the tray and swab locally with absorbent cotton to hasten removal of surface scum. The action is usually complete in 2 to 5 minutes. Remove the film or print from the tray immediately, if any reduction of shadow detail is noted. Wash thoroughly and dry.

(2) *Reduction of Negatives.* Use variation (b), especially if considerable reduction is required. Agitate occasionally, observing the progress of reduction. A guide as to the degree of reduction is given in Figure 4 for several materials. A reduction of 20 per cent will correspond to a change of about 1 grade of printing paper. Wash well following reduction.

(3) *Reduction of Prints and Fine-Grain Negative Materials.* This is particularly useful for slight overexposure or overdevelopment; strong reduction may result in loss of image quality, particularly with prints. Use variation (a), pre-wet, and remove from the reducer after 1 to 5 minutes. Wash well.

References

1. H. D. Russell and J. I. Crabtree, "The Reducing Action of Fixing Baths on the Silver Image," J. Soc. Mot. Pict. Eng., Vol. 43, pp. 371-397 (1932).

2. R. W. Henn and J. I. Crabtree, "Sulfide Stain—Its Nature, Cause, and Methods of Prevention", PSA Journal, Vol. 13, pp. 752-758 (1947).

J. I. Crabtree and R. W. Henn, "Scums, Sludges, and Stains—Their Sources, Prevention, and Removal," PSA Journal, Vol. 14, pp.201-209 (1948).

ERRATUM

To The Editor:

In the last sentence at the end of my paper "The Activity of Sodium Sulfite in Fixing Baths and the Stability of Thiosulfuric Acid" in the September issue the word *prevent* has been printed instead of the word *disengage*. The word *prevent* gives a completely different meaning while just the opposite should take place. I have no idea how it slipped into the sentence and escaped correction in the proof. The word should be "disengage", in the sense of *liberate* or *release* as, through sulfite and acid, the regeneration should be caused and not "prevented".

Emanuel Gruenthal

New York, 6 September 1951

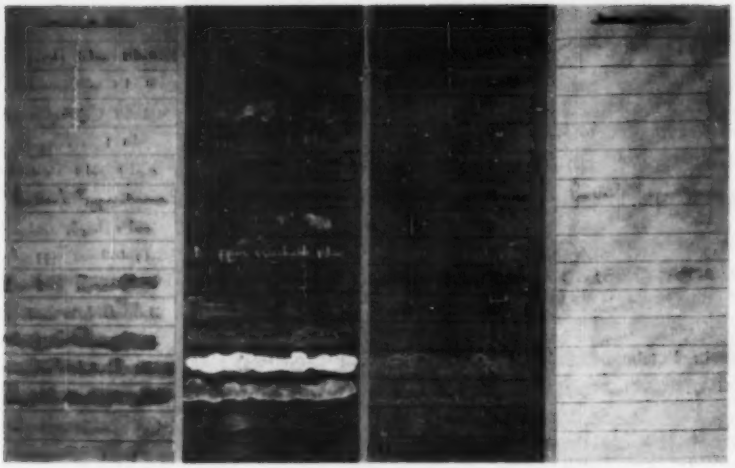


Fig. 1. Different writing inks erased or eradicated by various chemical means and photographed (from left to right): A. Reflected ultraviolet illumination, without filter; B. Fluorescent light photograph through Harrison K2 filter; C. Same technique using Wratten 2A filter; D. Ordinary film, lighting, and processing.

ULTRA-VIOLET PHOTOGRAPHY OF DOCUMENTS

JOSEPH THOLL*

THE NEAR ultraviolet and middle ultraviolet ranges of the solar spectrum constitute the most effective sources of irradiation for examining certain documents. Consequently, with many forms of physical evidence it is practicable to use ordinary picture taking equipment such as an anastigmat lens and panchromatic and orthchromatic film emulsions. Color-blind films are well adapted for photographs made by means of reflected ultraviolet rays.

The accompanying illustrations were made with a Speed Graphic camera equipped with a 127 mm Ektar lens mounted in a vertical position on a tripod. The films used for reflected ultraviolet photographs included, Eastman Commercial, Eastman Super-Speed Ortho, Process, and Kodalith. No filters were used for reflected ultraviolet pictures. Eastman Panchro-Press Type B, Super XX, and Process Panchromatic films were used for fluorescence ultraviolet photographs. Glass-mounted filters including Wratten B, C5, K2, 2A and a Harrison K2 were used over the camera lens for contrast and correction purposes in fluorescence ultraviolet photography.

The ultraviolet generating unit was a cold quartz lamp which provided a rich source of radiation in the 2549A, 2570A, and 2900A regions "Black light" lamps such as the General Electric B-H4, whose principal line of radiation is at 3650A, are very effective for document examination.

* Examiner of Questioned Documents, 2672 Mayfield Road, Cleveland 6, Ohio. Received 2 July, 1951. Previous papers by Mr. Tholl, dealing with infrared photography of documents, appeared in the February and April 1951 issues.

The photographic process, because of its selectivity, its susceptibility to technical control, and its recording possibilities, greatly extends the range of the visual ultraviolet examination of documents.[1] In forensic work evidentiary conditions which may appear inconclusive or negative by either visual or infrared examination can, frequently, be revealed through ultraviolet photography. In the case of weak or conflicting fluorescence, optical filtering and the selection of certain sensitized emulsions allow the camera to function well beyond the limitations of the unaided eye. Also, the superior resolution of short wave radiation provides a greater degree of sharpness and definition than is possible with ordinary visible illuminants.

Document falsifications such as artificial aging, mechanical and chemical erasures, substitutions, etc. are better demonstrated by a clear, brilliantly reproduced photograph than by a hard-to-see fluorescent demonstration in a darkened room. Even where identical conditions are disclosed the photograph which can be viewed in bright light is to be preferred to the more inconvenient, though direct, examination in a darkened room. Then too, the sensitized emulsion will record invisible phenomena which cannot be seen by any other method.

A document is a composite organic substance that, when exposed to ultraviolet radiation, fluoresces in many shades and colors which may be conflicting to the eye. Where one fluorescing color masks over or neutralizes another, existing evidence may be difficult or impossible to see under conditions of visual examination. In such a case the predominant, masking fluorescence may be of no significance while the weaker obliterated one discloses vital data. Selec-

tive filtering under these conditions can eliminate the undesired fluorescence while bringing out the important one. Natural color photographs of fluorescent material also may reveal details that are not seen by direct examination.

In some instances materials which appear confusingly similar by direct ultraviolet examination show marked differences when photographed. A typical case can be cited. Two smears of lipstick that appeared identical to the eye and only slightly different under ultraviolet illumination were unmistakably different in a fluorescence photograph.

The advantages of ultraviolet photographs (fluorescent and reflected) over the visual ultraviolet examination are summarized as follows: (1) Ultraviolet considerably extends the range of visual examination. (2) Ultraviolet photographs reveal identical conditions more clearly. (3) The photographic process intensifies hard-to-see conditions, records obscured and invisible reactions. (4) Invisible ultraviolet radiations are utilized as a selective and high resolving source of illumination.

The Two Processes of Ultraviolet Photography

There are two varieties of ultraviolet photography, namely, the reflected and fluorescence methods. In fluorescence photography the invisible ultraviolet rays are filtered out and only the visible, luminous radiation—the fluorescence—is allowed to enter the lens. Were the invisible rays not filtered out, they would, because of their powerful actinic action, expose and fog (latently) the emulsion long before the weaker fluorescing rays could act. The elimination of the invisible ultraviolet through filtering is not as efficient and easy an operation as it would seem. Where total filtering is accomplished the results are considerably more spectacular and brilliant than where a trace of ultraviolet inadvertently remains.

In the reflected process of ultraviolet photography the opposite procedure is followed. The same radiations which are filtered out in fluorescence photography are now utilized as a selective and highly resolving illuminant. This operation is possible since the invisible, actinic ultraviolet radiations are recorded on the sensitized emulsion a hundred times or so faster than are the weaker rays of fluorescence. The unique, selective behaviour of the invisible ultraviolet reveals differences in confusingly similar substances and brings out many kinds of hidden and obscured evidence.

The Reflected Ultraviolet Method

Reflected ultraviolet photography, or photography with invisible ultraviolet radiations, is a subject about which comparatively little has been written. The reflection method, like the fluorescent process, is used to compare, identify, and differentiate various substances; to bring out latent and hard-to-see evidence; and to show unusual structural details. Actually the difference in these two methods, the reflected and the fluorescence, is in the employment of different wave-lengths. In the fluorescence method the visible wavelengths (visible fluorescence) are utilized while in the reflected method shorter wavelengths beyond 400 $m\mu$ are used. The wavelengths longer than 400 $m\mu$, excited by the shorter wave lengths are, in effect, a form of invisible fluorescence. This factor of longer reflected ultraviolet radiations excited by shorter wavelengths makes possible, for reflected ultraviolet photography, the use of a glass lens that would not transmit short wave ultraviolet radiation.

The increased resolving properties of ultraviolet radiation coupled with its selective behaviour makes possible improved definition and sharpness as well as more pronounced tonal separation in the case of similar appearing substances. The hesitant, broken lines, retouching and retracing in forged signatures, and tampered document surfaces, can be demonstrated better with ultraviolet illumination than with visible light. Ultraviolet, in effect, gives an improved optical version of physical evidence. This superior resolution, in the case of short wave radiation, can only be fully realized through critical focus of the camera, an operation which can be determined for each lens by a series of experimental focal adjustments.

Exposure and Development (Reflected Process)

Ultraviolet radiation though highly actinic has very little contrast photographically and will, even with slight overexposure, block up shadows and highlights as well as produce an over-all fog. These adverse tendencies can be counteracted by (1) selecting the optimum exposure; (2) using a film of sufficient natural contrast; (3) giving optimum development in the proper developer. The choice of film depends on the nature of the physical evidence to be brought out—the considerations being, color, contrast and tonal separation. For example, Kodalith film and D-85 developer would be suitable in cases of poor contrast; for example, samples showing faint traces of chemical erasure. A medium contrast ortho film would be most effective for a multi-color surface.

To overcome the flat contrast and fogging tendencies of the invisible ultraviolet a critically timed exposure must be used. It has been observed repeatedly that incorrect exposure results in poor tonal separation and ob-

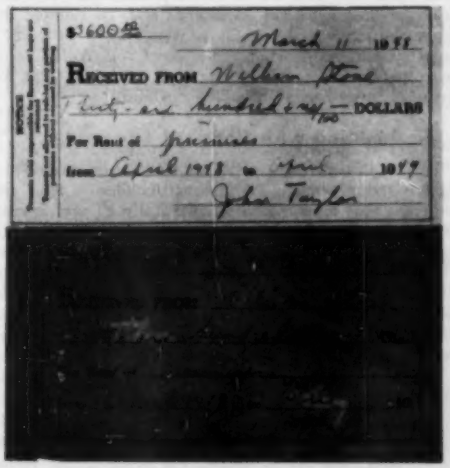


Fig. 2. The ordinary photograph of an altered document, above, suggests the presence of alterations that are clearly shown in the ultraviolet fluorescence photograph, below, that was exposed through a Wratten 2A filter.

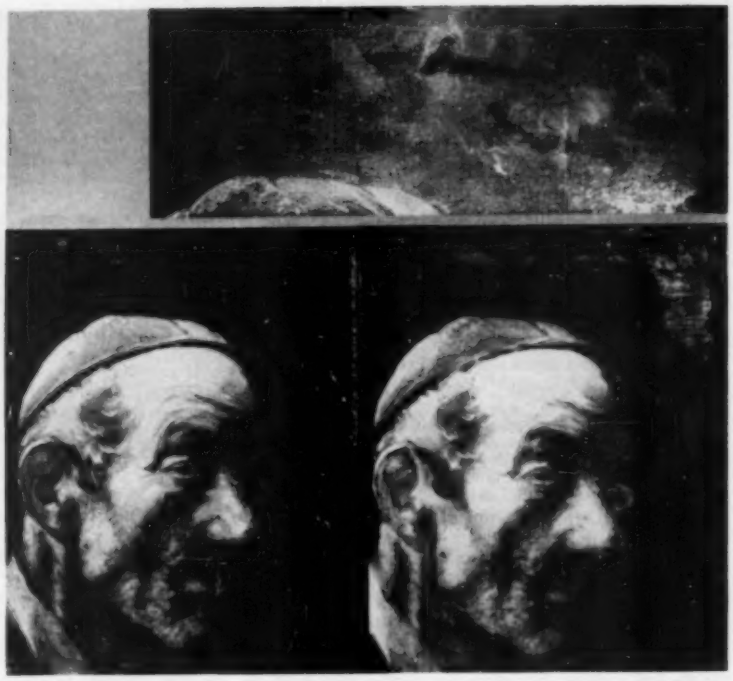


Fig. 3. The infrared photograph of an old painting (lower right) shows underpainting and sketching that are not visible in the ordinary photograph at the left. Above is a section of the upper right hand corner of the painting photographed by fluorescent light using a Harrison K2 filter which reveals an erasure.

scured detail. In a number of experimental exposures made of a document, 20 seconds at f/8 produced an extremely heavy, fogged negative; 20 seconds at f/16 resulted in a similar negative; 10 seconds at about f/18 produced a negative with good detail and without fog. All exposures were made with a cold quartz type ultraviolet unit and Eastman Super Speed Ortho Portrait film.

Lighting with Reflected Ultraviolet

Reflected ultraviolet photographs can be taken in a lighted room where a Wratten 18A filter is used over the lens. This filter eliminates practically all visible radiation, allowing only the component ultraviolet from the lighting source, reflected by the copy, to be transmitted. The Wratten 18A filter[3] transmits wavelengths from 290 $m\mu$ to 390 $m\mu$ with maximum transmittance at 363 $m\mu$. No special filter is necessary when screened ultraviolet radiation is used in a darkened room since the lens—which transmits from 340 $m\mu$—itself acts as the filter.

When invisible ultraviolet radiation is used as a side illuminant, like in the case of side lighting with visible light, textural details and contrast will be accentuated. The higher resolving properties of ultraviolet combined with sidelighting are invaluable for bringing out surface details on tampered documents. Ultraviolet cross illumination, on the other hand, gives maximum tonal separation and best brings out the unique selective properties of the source.

Uses for Reflected Ultraviolet Photographs

Reflected ultraviolet photography, so well adapted for the detection and demonstration of many classes of physical evidence, has the following principal uses:

1. Latent Evidence. The reflected ultraviolet technique may reveal latent or obscured evidence that does not fluoresce. In Figure 1, reflected ultraviolet has revealed many kinds of eradicated inks that are not made decipherable by fluorescence photography.

2. Differentiation of Substances. The selective ultraviolet reflection, transmission, and absorption properties of various materials and substances allows them, where they are confusingly similar in visual appearance, to be differentiated.

3. For Added Emphasis. Reflected ultraviolet photographs can be used to supplement ultraviolet fluorescence photographs, infrared photographs[2, 4] and conventional photographs to more emphatically (sometimes a necessity) disclose evidentiary conditions.

4. Used as an Illumination. Invisible ultraviolet radiation with its higher resolving power can often be used advantageously, in the place of conventional illuminants, to bring out hitherto unobserved structural details and for superior sharpness and definition.

The Fluorescence Technique

In the visual examination of documents by ultraviolet radiation fluorescent portions are sometimes masked over

or too weak to be of any forensic value. It is therefore significant that photography, in conjunction with selective filtering, makes it possible to record, satisfactorily, these elusive and hard-to-see phenomena.

Photographs of fluorescent materials are exposed using techniques similar to those used in the reflected ultraviolet method because of the inherent low contrast of the fluorescent emissions. That is, it is necessary to obtain a critically exposed well developed negative to compensate for inherent low contrast and to secure satisfactory tonal separation. The need for well defined tonal separation and good contrast is compelling in the case of weakly fluorescing forms of evidence.

A correct negative made by either the fluorescence or reflected method should, like any well balanced negative, have good contrast and detail. However, on account of the decreased latitude of exposure, the limitations of filters and inherent flatness, a number of trial exposures may be necessary to secure a good negative.

Lighting for Ultraviolet Photography

There are relatively few lighting problems to be encountered in either type of ultraviolet photography since the primary function of the ultraviolet source is to provide a flat illumination suitable for recording photo-chemical effects. The lone exception is provided by the use of ultraviolet as a side-illuminant in reflected ultraviolet photographs. Where visible transmitted light is combined with fluorescence through separate exposures, photographs of superlative sharpness and detail can be obtained.

Fig. 4. Fluorescence photograph of paper samples torn from the same sheet that have received different chemical treatment. The top set, made with a Wratten 2A filter, shows the effect of ultraviolet reflections that have been absorbed in the bottom set which was photographed through a Harrison K2 filter.

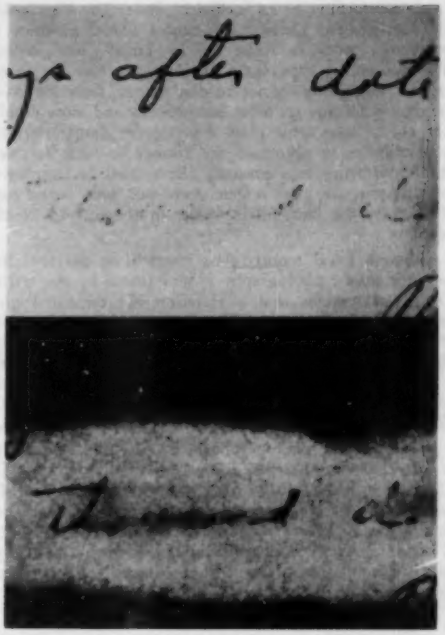


Fig. 5. Ultraviolet photographs of a mechanical erasure. The upper picture was made by reflected ultraviolet, the lower picture by fluorescence (Harrison K2 filter) after chemical treatment.

The Use of Filters in Fluorescence Photography

Selective filtering makes it possible to bring out one fluorescent emission while holding back or eliminating another. The filtering of fluorescent colors is essentially no different from the filtering of ordinary colored objects except for the more critical and limited application in the former case.

The effectiveness of filters for fluorescence photography depends on their ability to filter out the actinic, fogging ultraviolet and allow only the fluorescence itself to be transmitted. If a filter transmits even a trace of ultraviolet its effectiveness is greatly decreased for fluorescence photography. A filter which transmits slight amounts of ultraviolet combines in a single exposure more or less the effects of both the reflected and fluorescence processes. The ideal filter for fluorescence work cuts the spectrum band sharply at 400 $m\mu$, transmits no ultraviolet, and allows only the visible fluorescent light to be transmitted through the camera lens.

The more ultraviolet transmitted by a filter the less the exposure time and the less marked the fluorescent record. Special liquid chemical filters may be used to isolate definite lines but their use entails special equipment and processes so the present paper deals only with the use of the conventional glass mounted filters.

Many workers secure results with ultraviolet photography of indifferent quality or fail entirely because of the use

of the wrong filter or an inefficient filter. The inescapable fact that efficient filtering constitutes a real problem in fluorescence work is borne out by Lucas[5], who writes: "The fluorescent appearance of an object may be photographed, though this is not an easy matter, since the invisible ultraviolet rays act more energetically and more rapidly upon the photographic plate than do the fluorescing rays and, in order to eliminate the former as well as many other interfering rays present, filters must be employed. For this purpose glass screens have not been found very satisfactory, the best filters being thin layers of certain solutions . . ."

Although Lucas reports glass filters to be unsatisfactory for fluorescence photography it was found by the writer, after several trials, that a Harrison K2 cemented glass filter very effectively filtered out the invisible ultraviolet while allowing only the fluorescent radiation to be recorded. The excellence of this filter for fluorescent photography is demonstrated by Figures 1, 3, and 5. Since all of the invisible ultraviolet was absorbed by the Harrison K2 the filter factor had to be considerably increased. (2 to 5X).

In fluorescence photography filters are used for contrast or correction purposes just as in ordinary photography. The K2 filter, which absorbs blue and violet, is one of the most useful screens since there is, in documents, a predominance of bluish fluorescence. On the other hand a Wratten C5 or B filter will emphasize the bluish fluorescence where necessary. Other filters utilized for fluorescence photography included the Wratten 2A, X1, and X2.

Color Fluorescence Photography

The integral tripack films for natural color photography, such as Ansco color, Ektachrome and Kodachrome, because of their comparatively high speed and accurate rendition of colors, and their convenience, are superior to other methods of natural color photography. The tripack emulsions which selectively cover all the spectrum colors in many ways constitute an ideal medium for this purpose. Just as in black and white photography the primary consideration for colored fluorescence recording on natural color film is that no traces of ultraviolet be transmitted by the filter. Where there is any leakage or transmission of ultraviolet there will be a general dulling and the presence of a bluish overcast in the color photograph. In the writer's opinion, the ideal optical filter for fluorescence color recording on color film has yet to be made.

A valuable function of natural color fluorescence photography is that the three individual sensitized emulsions with their separate ranges of color sensitivity record, in many cases, emissions that are too weak to be seen. Natural color fluorescence photography combines the advantages of visual examination along with the advantages of the extended range of usefulness provided by the photographic process.

Chemical Reagents

Chemical reagents may be used to induce fluorescence in a substance which does not otherwise respond to ultraviolet irradiation. The reagent, through chemical activity, produces a reaction that is seen either through the exciting or the quenching of fluorescence. In either case the evidence will stand out in contrast against the surrounding surface. Reagents have been employed to bring out faded and obscured writing, printed matter, mechanical and chemical erasures. Figure 5 shows how a mechanical erasure that did not respond to either reflected ultraviolet illumination or infrared but was brought out through chemically induced fluorescence. The reagent used was a 5% solution of salicylic acid in alcohol which was painted on the back of the document. Chemical reagents, because they in some measure alter a document, should be used with great care and only as a last resort and tests should be made to avoid destruction of the evidence.

References

1. Joseph Tholl, "Ultraviolet in Court: Its Use is No Longer for Experts Only". American Bar Assn. Journal, Vol. 37, No. 8, p. 591 (Aug. 1951).

2. "Kodak Filters and Lens Attachments". Eastman Kodak Company (1950).

3. Joseph Tholl, "Infrared Contact Photography of Documents". Photographic Science and Technique, Vol. 17, No. 1, February 1951.

4. Joseph Tholl, "Infrared Photography of Docments, Part II, Camera Technique". Photographic Science and Technique, Vol. 17, No. 2, April 1951.

5. A. Lucas, "Forensic Chemistry and Scientific Criminal Investigation", page 278.

PLASTIC SCREENS FOR PRINT DRYERS

Instead of the muslin or cheese cloth covered stretchers commonly used in dryers for photographic prints, the Bachrach Finishing Plant in Newton, Massachusetts has been using for several years ordinary plastic window screening. The screening is tacked on large frames of wood, which are held horizontally in a cabinet through which warm air is blown by a fan. The prints are laid face down on the screens, and covered with single thicknesses of blotting paper.

Firestone Plastic Velon Screening, which retails locally for 28 cents per linear foot in 24-inch widths, has given good results. The colorless, plastic strands are 0.015 inch thick and woven 18 to the inch.

Plastic screens have the following advantages over the materials usually used in print dryers: (1) lintless, (2) greater rigidity and strength, (3) better ventilation, (4) collect less dirt, and (5) can be washed easily, which is done twice a year in the Bachrach plant.

J. M. PURCELL

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